JOURNAL
OF THE
AMERICAN VETERINARY MEDICAL ASSOCIATION

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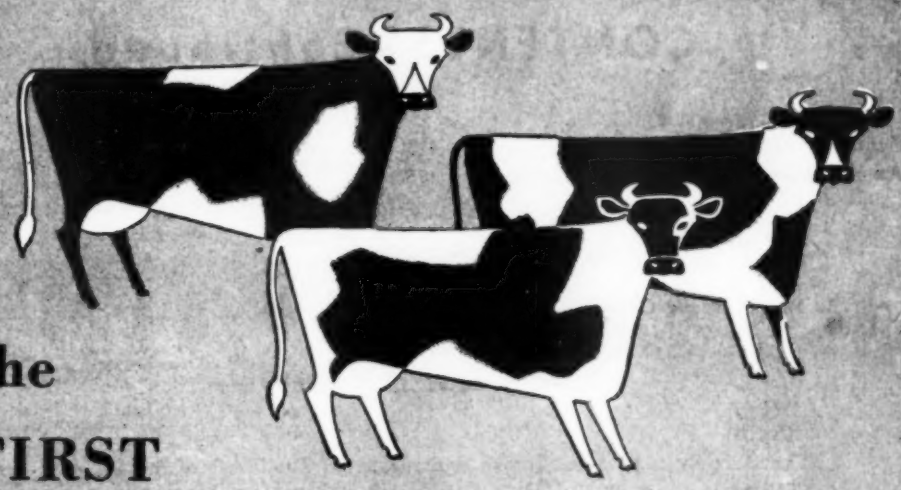

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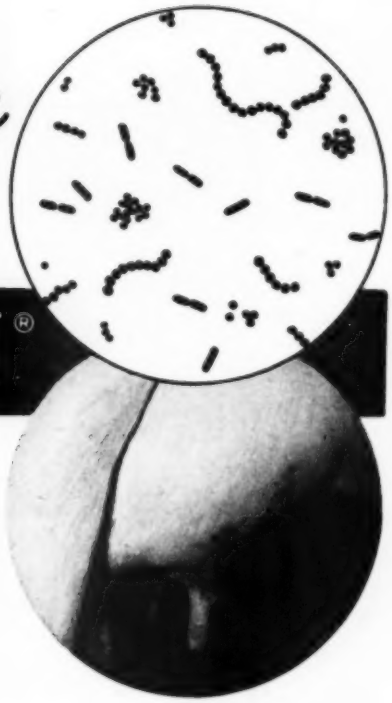

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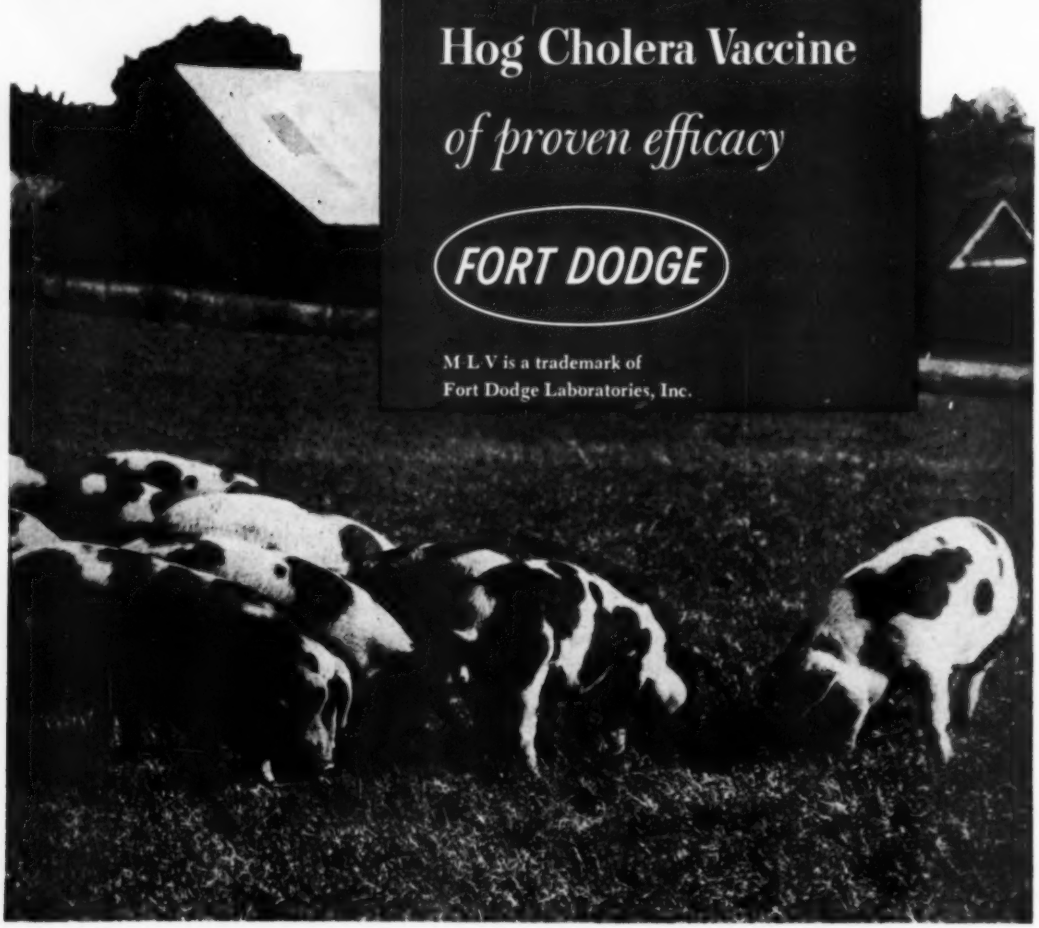

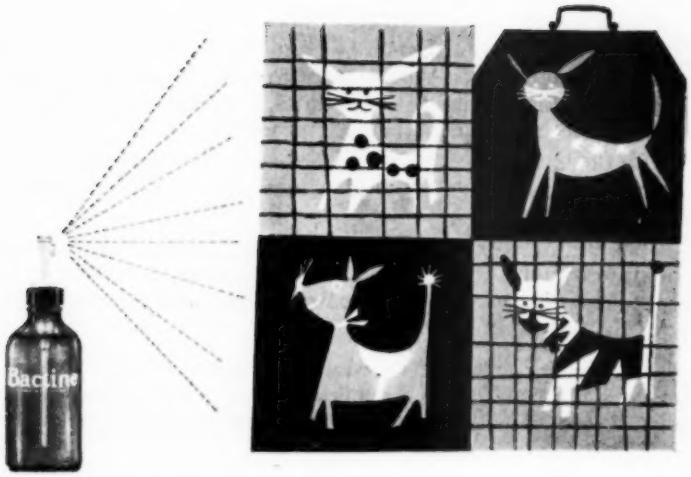

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AVMA ☆ Report

Veterinary Medical Activities

The AVMA Special Committee on Veterinary Supply Problems met at Association headquarters on April 27-28 to consider, survey, and evaluate the many elements relating to the effect of sales, dispensing, and merchandising of veterinary pharmaceutical and biological products.

The Committee recognizes a series of developments in this field that can not be considered as being in the best interests of those closely associated with the veterinary profession.

Time did not permit the preparation of specific recommendations or programs for final adoption by the Association; however, a number of basic premises were suggested as being worthy of consideration and implementation by all members of the AVMA:

1) The desirable and necessary functions of prescribing and dispensing must not be jeopardized through nonprofessional merchandizing which results when the sales of professional products are made without knowledge of the needs of the patients or the symptoms shown.

2) Laws, regulations, or practices designed to protect the livestock owner against exploitation from unscrupulous commercial or professional sources must be supported and violators vigorously prosecuted.

3) Veterinarians, both as individuals and as groups, should look with skepticism on practice-building and promotional aids offered by all commercial institutions. These either tend to limit the professional prerogative of the veterinarian to purchase supplies from sources of his preference or they attempt to influence the client to stipulate that a specific company product be dispensed.

4) Veterinary colleges can aid materially in proper indoctrination of students in the principles of professional ideals, professional relationships, public relationships, and the AVMA Code of Ethics. They must also teach the art as well as the science of veterinary medicine.

5) The needs of the livestock industry and the public can be met by providing improved facilities at the community level; by an increase in the numbers of veterinarians, thereby permitting the extension of services into additional areas; by rendering a complete veterinary service at all times; and by each AVMA member taking justifiable pride in his personal, professional, and interprofessional relationships.

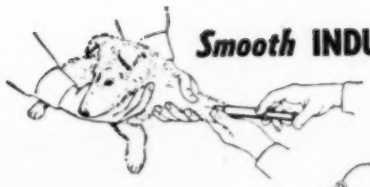
Members of the Committee attending were Drs. F. B. Young, Waukee, Iowa; R. O. Anderson, Elkhorn, Wis.; P. E. Madsen, Sheridan, Wyo.; R. C. Klussendorf, Terre Haute, Ind.; and Kenneth Whittington, Memphis, Tenn. Drs. A. H. Quin, President-Elect, J. G. Hardenbergh and H. E. Kingman, Jr., from the central office, also participated in part or all of the two-day deliberations.

★ ★ ★

✤ The Fellowship Committee of the Research Council (Drs. Robert Getty, L. C. Ferguson, T. Lloyd Jones, D. K. Detweiler, C. A. Brandly, M. A. Emmerson, and C. H. Cunningham) met at Association headquarters April 26 and considered a number of applications.

★ ★ ★

✤ During April, President J. A. McCallam appointed a new committee to give special attention to audio-visual aids and their application to educational, public relations, and public information programs of the AVMA. Dr. Robert Getty, Ames, Iowa, has been asked to serve as chairman, and Drs. C. D. Van Houweling, J. A. Henderson, Colonel Ralph Mohri, J. R. Pickard, C. L. Nelson, R. E. Rebrassier, Wayne H. Riser, and Frank A. Todd as members, and Dr. H. E. Kingman, Jr., and Mr. R. G. Rongren as consulting members of the AVMA Special Committee on Motion Pictures and TV.



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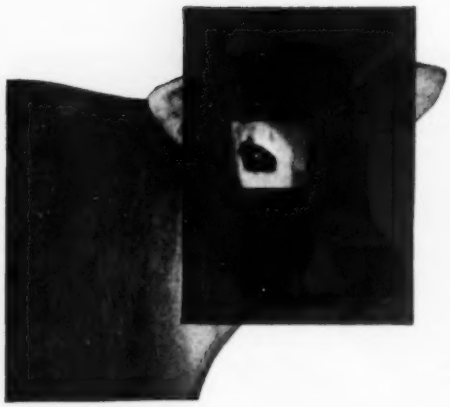

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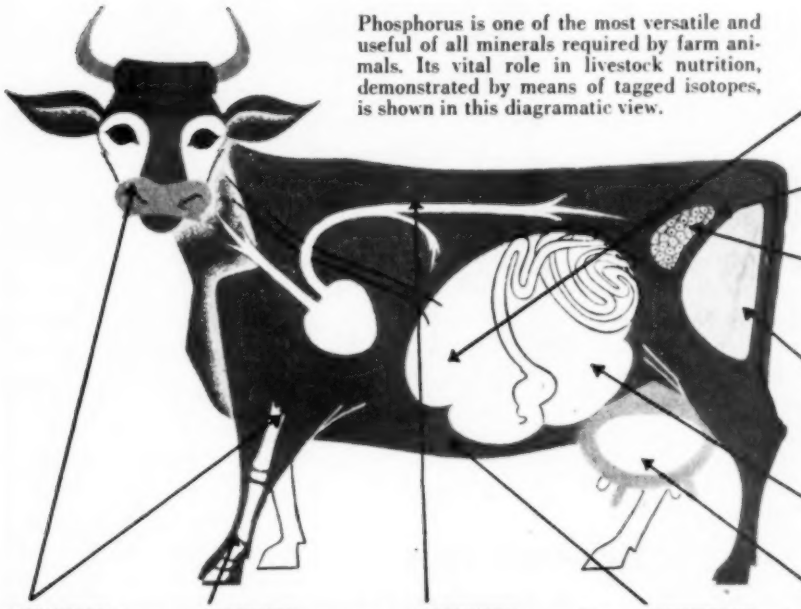

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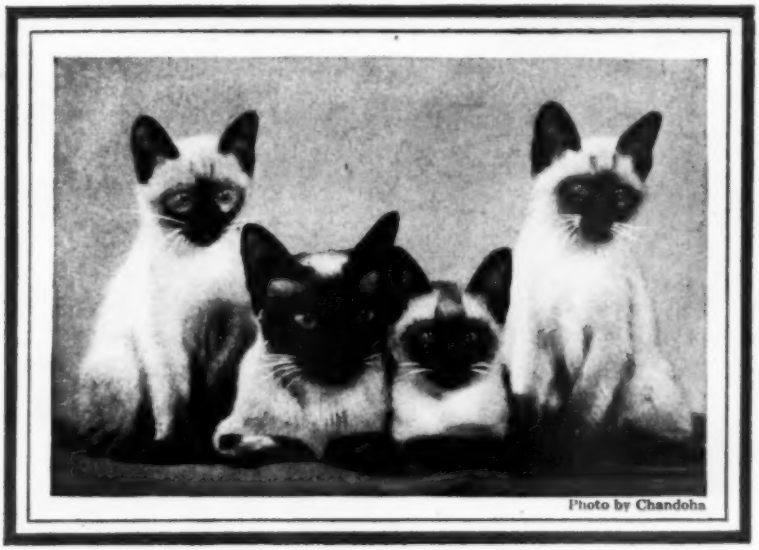

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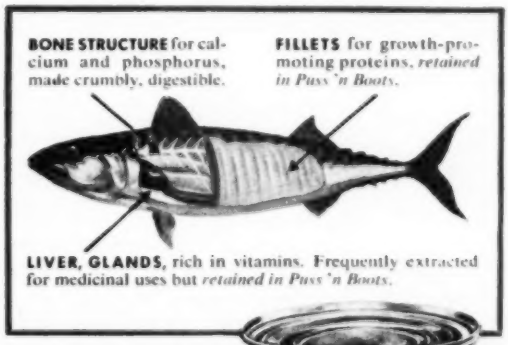
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*Klausman, B. S.: The Use of a New Chemotherapeutic Agent to Arrest Bleeding in Animals, Vet. Med. *46*:282, 1951.

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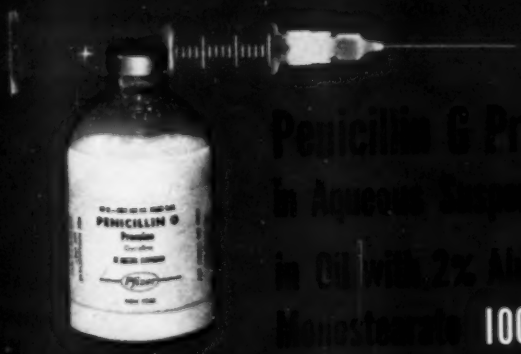

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Studies on Leptospirosis in Domestic Animals
III. Incidence of Leptospirosis in Cattle and Swine in Illinois

H. S. BRYAN, D.V.M., Ph.D.

Urbana, Illinois

LEPTOSPIROSIS has occurred in cattle,[1] swine,[2] sheep,[3] and horses[4] in Illinois. *Leptospira pomona* was believed to be the causative agent in these outbreaks, but the organism has been isolated and identified only from swine.

The clinical diagnosis of leptospirosis in animals has been hampered by the varied manifestations of the disease. Another major difficulty in establishing a diagnosis has been the lack of a rapid, accurate laboratory test. These diagnostic obstacles have delayed for many years the accumulation of evidence on the incidence of the disease in animals. In recent years, the agglutination-lysis and complement-fixation tests have been employed as diagnostic aids with encouraging results. Both appear to be specific for the species of Leptospira under study, but the disadvantage of both tests is the tedious and time-consuming steps necessary in performing them. The agglutination-lysis test has the advantage in that it detects specific antibodies for years following an infection, whereas the complement-fixing antibodies usually disappear within several months after leptospiral infection.

Practicing veterinarians have developed a deep interest in leptospirosis and its diagnosis. The presence of physical signs of the disease, confirmed by isolation and identification of the causative agent, establishes a firm etiological diagnosis. Clinical symptoms, alone, offer only a presumptive diagnosis. The isolation of Leptospira, with the present methods available, is not easily accomplished. Of necessity then, serological reactions designed to detect specific antibodies in the blood serum are relied upon frequently. Positive serological results should be considered as strong supportive evidence but not as definite as the isolation and identification of the organism. In an attempt to appraise the incidence of leptospirosis in cattle and swine in Illinois, the results of the agglutination-lysis tests conducted on cattle and swine blood samples in this laboratory are reported herewith.

From the Department of Veterinary Pathology and Hygiene, College of Veterinary Medicine, and the Agricultural Experiment Station, University of Illinois, Urbana.

This investigation was supported in part by a grant from the University of Illinois Research Board, Urbana, as well as funds from the State Department of Agriculture, Springfield.

The author gratefully acknowledges the technical assistance of Harold Bahe, Fred Hembrough, Rachel Marlowe, and Jane DuBois.

MATERIALS AND METHODS

Blood serum samples were submitted to the diagnostic laboratory of the College of Veterinary Medicine by veterinary practitioners for the brucellosis agglutination test and/or the agglutination-lysis test for leptospirosis. The majority of the tests reported were made between December, 1952, and May, 1953; however, some were made as early as May, 1952. During the months of December, 1952, and January, February, and May of 1953, all bovine and swine blood samples submitted to the laboratory in satisfactory condition were subjected to the leptospirosis agglutination-lysis test.

The agglutination-lysis test, using viable *L. pomona* organisms as the antigen, was the serological test employed throughout the study. The strain of the organism used in preparing the antigen was secured from Dr. Karl R. Reinhard and was designated as NYB_5. The antigen consisted of 5- to 7-day-old motile cultures grown in

modified Schüffner's[5] medium containing 10 per cent horse serum.

For routine testing, four serum dilutions were employed: 1:10, 1:100, 1:1,000, and 1:10,000. The tests were conducted by placing 0.1 ml. of each serum dilution and 0.1 ml. of the culture in a small serological tube. The serum-antigen mixtures were then allowed to incubate at room temperature for approximately four hours. The individual tubes were examined by viewing small drops of the serum-antigen mixture by dark field illumination at a magnification of 100. A serum was judged negative when the leptospiras remained uniformly spread throughout the field in all dilutions similar to the antigen control. Serums were designated as positive when agglutination and/or lysis of approximately one-half or more of the leptospiras had occurred in one or more of the serum dilutions. End titers were not determined.

RESULTS

Of the 1,528 bovine herds tested, 418 (27.4%) contained 1 or more positive animals (table 1). From these herds 15,018 serum samples were tested, of which 1,677 (11.2%) were positive.

In 263 swine herds tested, 77 (29.3%) had 1 or more positive animals in the herd (table 1). A total of 1,990 swine blood samples were tested, of which 293 (14.7%) were positive.

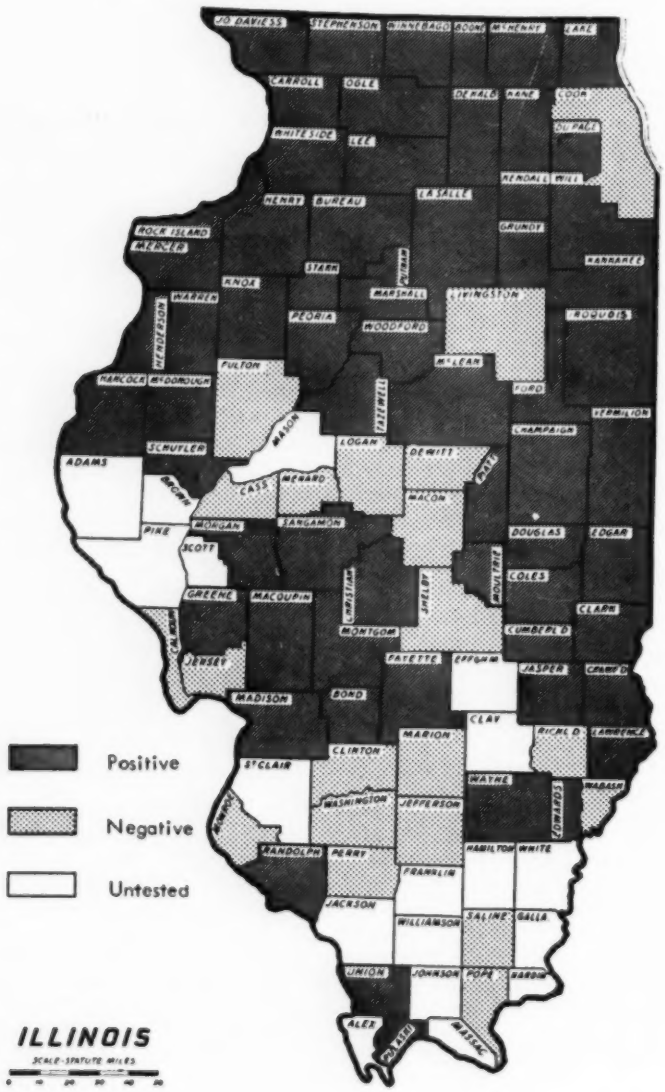

Fig. 1—Incidence of leptospirosis in Illinois cattle and swine herds as shown by agglutination-lysis tests.

During the four-month period of the survey (December, 1952; January, February, and May, 1953), the results on samples tested on request for leptospirosis, and samples originally submitted for the brucellosis test but also tested for leptospirosis, were tabulated separately (tables 2 and 3). Of the requested tests for bovine leptospirosis, 30.1 per cent of 213 herds contained positive animals; of 1,989 cattle tested, 19.7 per cent were positive. In the nonrequested tests for bovine leptospirosis; 19.8 per cent of 788 herds contained positive animals; and of 8,012 cattle tested, 4.7 per cent were positive. Of the requested tests for swine leptospirosis, 36.4 per cent of 66 herds contained positive animals; and of 455 swine tested, 25.9 per cent were positive. In the nonrequested tests for swine leptospirosis, 13.0 per cent of 46 herds contained positive animals; and of 381 swine tested, 3.7 per cent were positive.

The distribution of positive cattle and swine herds in Illinois is illustrated in figure 1. Positive herds were encountered in 63 (61.8%) of the 102 counties in the state. Twenty-one (20.6%) counties had herds which were tested but in which no evidence of infection was found. Eighteen (17.6%) counties remained untested. Positive herds were located in 75.0 per cent of the 84 counties tested.

DISCUSSION

The serological results presented indicate that infection with *L. pomona* among cattle and swine is widespread in Illinois. In Ohio, Bohl and Ferguson,[6] using the agglutination-lysis test with *L. pomona* as antigen, detected 12 positive cattle of 352 animals examined from 130 herds. In swine, the same authors found 5 positive animals of 280 tested. In New York State, York[7] employed the complement-fixation test, with *L. pomona* as antigen, in 1,074 cattle from 105 herds in 33 counties. His results showed positive tests for 12.8 per cent of the cattle in 35.2 per cent of the herds from 57.2 per cent of the counties. The results in testing cattle in Illinois are comparable to those reported in New York.

Clinical cases of leptospirosis in Illinois are not reported by veterinary practitioners as frequently as one might expect from the serological results. However, mild, transitory symptoms may have occurred unrecognized and it may be presumed that infections have escaped notice. Reinhard,[8] York,[7] and others have described the variability of the symptoms in bovine leptospirosis, recognizing the occurrence of asymptomatic or nonapparent forms of the disease. Since it is believed that the agglutination-lysis test has a high degree of specificity, one must conclude that leptospirosis is more prevalent in Illinois than is generally recognized.

In many of the positive-reacting cattle and swine herds, a high percentage of the animals were positive, indicating that the organism was readily transmitted from animal to animal. While many of the reacting animals displayed no recognizable clinical symptoms, abortion frequently was reported as the only symptom observed. In reply to a questionnaire answered by practicing veterinarians, abortion was reported in 58 per cent of 125 positive-reacting cattle herds and in 85 per cent of 54 positive-reacting swine herds. The other symptoms of leptospirosis noted, in compiling the answers to the questionnaire covering the 125 positive-reacting cattle herds, included: fever, 38 per cent; anorexia, 42 per cent; hemoglobinuria, 30 per cent; icterus, 15 per cent; anemia, 19 per cent; abnormal milk, 31 per cent; and reduction in milk flow in 47 per cent. In the 54 positive-reacting swine herds veterinarians indicated the symptoms with the following frequency: fever, 22 per cent; anorexia, 30 per cent; hemoglobinuria, 11 per cent; icterus, 13 per cent; anemia, 9

TABLE 1—Incidence of Leptospirosis in Illinois as Shown by Agglutination-Lysis Tests on Cattle and Swine Blood Serums

Species	Herds tested	Herds pos. (No.)	Herds pos. (%)	Animals tested	Animals pos. (No.)	Animals pos. (%)
Cattle	1,526	418	27.4	15,018	1,677	11.2
Swine	263	77	29.3	1,990	293	14.7

TABLE 2—Results of Requested Leptospirosis Agglutination-Lysis Tests During a Four-Month Survey

Species	Herds tested	Herds pos. (No.)	Herds pos. (%)	Animals tested	Animals pos. (No.)	Animals pos. (%)
Cattle	213	64	30.1	1,989	393	19.7
Swine	66	24	36.4	455	118	25.9

TABLE 3—Results of Nonrequested Leptospirosis Agglutination-Lysis Tests During a Four-Month Survey

Species	Herds tested	Herds pos. (No.)	Herds pos. (%)	Animals tested	Animals pos. (No.)	Animals pos. (%)
Cattle	788	156	19.8	8,012	377	4.7
Swine	46	6	13.0	381	14	3.7

per cent; abnormal milk, 6 per cent; and reduction in milk flow, 7 per cent. The replies to the questionnaire indicate that abortion, especially in positive-reacting swine herds, was an outstanding feature of leptospirosis in Illinois.

During the four-month survey when a record was maintained as to whether the practicing veterinarian specifically requested the blood test for leptospirosis, the results showed that a higher percentage of positive reactions occurred in the blood samples which had been designated for leptospirosis testing than in the samples collected at random. This was true for both the cattle and swine samples.

SUMMARY

A report was made of the results of serum agglutination-lysis tests for leptospirosis conducted on blood samples from cattle and swine in the diagnostic laboratory of the University of Illinois, College of Veterinary Medicine. A living culture antigen of *Leptospira pomona* was employed.

Of the 1,528 bovine herds tested, 418 (27.4%) contained 1 or more positive animals. From these herds 15,018 serum samples were tested, of which 1,677 (11.2%) were positive.

In 263 swine herds tested, 77 (29.3%) had 1 or more positive animals in the herd. A total of 1,990 swine blood samples were tested, of which 293 (14.7%) were positive.

The distribution of positive cattle and swine herds in Illinois was shown to be widespread. Positive herds were located in 63 (75.0%) of the 84 counties tested.

In 125 cattle herds with positive reactions, veterinarians reported abortion in 58 per cent of the herds; they reported this symptom in 85 per cent of the 54 positive swine herds. Abortion, especially in swine, appeared to be one of the outstanding features of leptospirosis in Illinois.

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The Role of Swine as *Leptospira Pomona* Carriers

Leptospira pomona produced infection in the 25 swine inoculated subcutaneously, in the 7 inoculated intranasally, but in only 1 of 7 exposed orally, in research reported by Burnstein and Baker (*J. Infect. Dis.* (Jan., 1954): 53-64). All of the 10 susceptible pigs and 4 calves subjected to pen exposure with these infected pigs developed *L. pomona* infection. However, none of 7 pigs subjected to pen exposure with infected calves became infected. All of the 43 infected pigs were positive to the agglutination-lysis test and Leptospira organisms were isolated from the blood, urine, or tissue of 41; yet, while the majority of these animals were found to have a brief temperature reaction of 105 to 107 F., in seven to thirteen days after inoculation all but 2 remained alert and ate normally. The other 2 developed an acute icteric form of infection resembling that in canine, bovine, or human cases of leptospirosis.

Leptospiras were found in the blood only in the early stages of infection, and in the urine later. Minor lesions may be found in the lungs, liver, and kidneys early but only in the kidneys later. Soon after the thermal reaction, antibodies could be demonstrated in the blood and leptospiras in the urine. The shedding of organisms in the urine, usually in enormous numbers, continued as long as the pigs were allowed to live—to postinoculation day 159 in 1 pig. This, and the fact that leptospiras are usually excreted in smaller numbers and for a shorter time in the urine of infected cattle, indicate that swine are probably the chief host carriers of *L. pomona*. That the disease is widespread in swine was again indicated in serological surveys where 22 per cent of 285 serums collected at Chicago and Denver

packing houses were positive, and antibodies were found in all of 39 samples of hog cholera antiserum.

Leptospirosis is not a new disease which is sweeping the country. Any symptoms or lesions it produces can be duplicated by other diseases. The organism lives only a short time in a carcass or in specimens, and it is destroyed by freezing. Antibiotics have little value and the use of vaccines usually is not warranted. By the time the disease is recognized in a herd, most of the animals may have had a mild attack and be immune.—*W. S. Monlux, D.V.M., Iowa State College, Ames.*

Leptospira organisms can be isolated from the patient's blood during the septicemic stage (first 5 days of the fever stage), from the urine for several months after that, and from the liver and kidneys in both stages at necropsy.—*H. J. Hardenbrook, D.V.M., University of Illinois, Urbana.*

Leptospira and Periodic Ophthalmia.—In 24 cases of equine periodic ophthalmia, the agglutination titer for *Leptospira pomona* or *Leptospira grippotyphosa* in recent infections was higher in the serum than in the aqueous humor but, during relapses or in cases of long standing, this was reversed. —*Vet. Bull., Feb., 1954.*

Rat eradication is an important step in the control of leptospirosis.—*R. E. Witter, D.V.M., Illinois.*

The Epizootic Score Card

Scrapie in Connecticut, New York, Ohio. —Because of the presence of the contagious sheep neurosis, scrapie, federal quarantines were imposed April 8, 1954, on Litchfield County in Connecticut and Genesee County in New York, and were continued on Erie County, New York, and Licking, Shelby, and Vinton counties in Ohio.

Outbreaks of scrapie in California on Nov. 25, 1952, and in Illinois on April 14, 1953, were eradicated soon after. Three Ohio counties were first quarantined on April 14, 1953; one of these counties was declared free and a new county was quarantined on Feb. 8, 1954.

Vesicular Exanthema Again Found in Michigan.—The Agricultural Research Service announced on April 15, 1954, that federal quarantines for vesicular exanthema of swine had been imposed on three townships in Michigan. Quarantines had been removed from parts of California, Massachusetts, and Rhode Island. Nine states now are affected.

Supplement to the 1952 and 1953 Reports of the Special Committee on Veterinary Service

[Because this supplement to the 1952 and 1953 reports of the Special Committee on Veterinary Service was omitted through an oversight from the 1953 Proceedings Book, it is now published in the JOURNAL by request of the Committee.—Ed.]

As stated in the 1951 and 1952 reports from this committee, an extensive survey of the economics of the practice of veterinary medicine has been conducted. Approximately 6,000 veterinarians in the United States who, according to AVMA office records, were engaged in some phase of practice were sent the following questionnaire:

Committee on Veterinary Service

Dear Doctor:

In order that the American Veterinary Medical Association can give greater service and carry on a more effective program, we are making a survey of veterinarians throughout the nation. The information you are asked to give below will be kept strictly confidential and will be used only in combination with that from others for statistical purposes. To help us help you, won't you take a few minutes now to fill out this questionnaire and return it to us unsigned?

1) What is the approximate population of the city or town in which your office is located?
_____Number

2) In what state are you located? _____

3) What is your age? _____ Year of Graduation? _____

4) About how many years have you been practicing veterinary medicine? _____ Years

5) About what per cent of your gross income from veterinary practice was derived from:

a) Dairy and beef cattle?_____per cent
b) Swine? _____per cent
c) Horses and mules?_____per cent
d) Dogs and cats?_____per cent
e) Sheep and goats?_____per cent
f) Poultry? _____per cent
g) Other local veterinary activity (such as meat inspection, sales barn, etc.
(specify _____per cent

100 per cent

TABLE I—Earnings of Veterinarians in the United States in Practice by States Within Regions, and Comparative Rank (1950-1951)

State	Total No. of D.V.M.'s	No. of D.V.M.'s report.	Rank	Ave. gross income	No. of D.V.M.'s report.	Rank	Ave. net income
Conn.	140	40	9	20,593	40	10	8,418
Maine	74	15	29	16,360	15	18	7,347
Mass.	225	27	12	20,337	29	16	7,531
N. H.	54	7	21	17,357	7	21	7,271
R. I.	29	5	49	8,220	5	40	5,839
Vt.	71	12	41	12,633	12	48	4,475
New Eng.	593	106		18,505	108		7,399
Del.	45	9	39	13,289	7	37	6,443
D. C.	78	4	1	29,750	6	2	11,033
Md.	239	25	10	20,484	25	3	9,728
N. J.	316	44	25	17,016	43	13	7,905
N. Y.	1,084	97	33	15,262	97	27	6,912
Pa.	737	104	44	11,952	105	38	6,024
Mid. At.	2,499	283		14,922	283		7,058
Ala.	266	30	40	12,848	31	46	5,112
Fla.	261	43	4	25,428	43	7	9,221
Ga.	299	38	17	18,229	29	32	6,767
Ky.	179	30	18	18,217	31	8	8,613
La.	142	16	14	19,613	18	36	6,478
Miss.	129	18	42	12,189	17	47	5,065
N. Car.	192	37	34	14,630	38	24	7,010
S. Car.	119	15	11	20,427	15	20	7,333
Tenn.	169	25	27	16,576	26	15	7,650
Va.	232	41	31	15,495	41	25	6,980
W. Va.	74	13	48	10,585	13	35	6,480
S. E.	2,062	306		17,275	312		7,159
Ill.	944	92	5	23,848	94	6	9,276
Ind.	592	68	32	15,371	69	44	5,668
Iowa	962	82	2	26,720	82	5	9,374
Kan.	439	63	37	13,532	63	39	5,960
Mich.	626	53	45	11,898	53	41	5,762
Minn.	495	65	13	20,098	67	12	8,163
Mo.	492	68	23	17,187	68	29	6,894
Neb.	359	36	7	22,508	36	9	8,589
N. Dak.	77	12	28	16,475	14	17	7,400
Ohio	903	77	24	17,043	79	31	6,854
S. Dak.	123	11	15	19,409	11	28	6,912
Wis.	462	73	36	13,775	73	26	6,936
Midwest	6,474	700		18,468	709		7,407
Ariz.	86	14	6	22,800	14	11	8,286
Ark.	109	11	47	10,728	13	49	4,346
N. M.	52	10	3	26,250	10	1	13,500
Okla.	233	36	20	17,856	36	23	7,036
Texas	745	90	30	16,351	90	34	6,523
S. W.	1,225	161		17,479	163		7,042
Calif.	1,172	124	8	21,587	124	4	9,647
Colo.	265	43	22	17,277	45	30	6,867
Idaho	93	24	46	11,583	25	45	5,332
Mont.	98	10	38	13,490	10	42	5,690
Nev.	34	3	26	17,000	3	19	7,333
Ore.	201	37	19	18,200	39	22	7,267
Utah	77	4	43	12,100	4	33	6,650
Wash.	332	50	16	18,324	51	14	7,751
Wyo.	57	11	35	14,272	11	43	5,682
West	2,329	306		18,557	312		7,966
United States	15,182	1,862		17,664	1,887		7,374

The committee gratefully acknowledges the excellent coöperation and services performed by Dr. Boyd Harshbarger (Ph.D.), head of the Department of Statistics and director of the Statistical Laboratory at Virginia Polytechnic Institute, and Mr. M. E. Terry, director of I.B.M. studies in the V.P.I. department and laboratory. The tables and discussion of them, which are part of this report, were prepared by Mr. Terry.

6) About what was your *gross* income in 1950 from veterinary practice? _____Dollars

7) About what was your *net* income in 1950 from veterinary practice? _____Dollars

8) About what was your average yearly net income from practice during the:

a) Last five years (1946 through 1950)?
_____Dollars

b) Last ten years (1941 through 1950)?
_____Dollars

9) About what was your income in 1950 from participation in state and federal disease control programs? _____Dollars

10) Do you own the buildings and land used mainly for your practice?

Yes ( ) No ( )

If "Yes":

About what is the current value of the buildings and land? _____Dollars

11) Do you own the equipment and supplies used for your practice?

Yes ( ) No ( )

12) Do you have a source of income other than from practice?

Yes ( ) No ( )

a) What from? (specify)

13) What civic, service club, church, or municipal offices or positions have you held?

Please complete and return this questionnaire to the AVMA office in the enclosed envelope that does not require a stamp.

Thanking you in advance. I remain

Very truly yours,

E. J. Frick, *Chairman*

TABLE 2—Percentage of Practice and Income by Categories of Practice by States (1950-1951)

State	Beef & dairy cattle	Swine	Horses and mules	Dogs and cats	Sheep and goats	Poultry	Other
Ala.	7	11	37	37	1	3	4
Ariz.	25	4	5	64	1	0	3
Ark.	53	6	4	33	2	1	0
Calif.	35	3	12	49	1	0	0
Colo.	40	5	3	43	4	1	3
Conn.	25	1	2	66	1	1	4
Del.	31	11	6	47	0	4	1
D. C.	0	0	0	99	0	0	1
Fla.	18	4	7	70	0	0	2
Ga.	33	18	8	37	0	0	3
Idaho	63	7	5	18	2	1	4
Ill.	35	31	2	28	1	1	1
Ind.	33	34	3	23	2	4	0
Iowa	29	52	2	8	2	6	1
Kan.	56	13	4	19	3	3	3
Ky.	46	9	18	25	2	0	0
La.	48	5	6	41	1	0	1
Maine	58	3	4	34	1	0	1
Md.	26	3	11	58	1	0	0
Mass.	14	2	5	76	1	0	2
Mich.	39	4	2	50	1	1	3
Minn.	41	33	2	15	2	4	3
Miss.	55	10	6	22	1	0	5
Mo.	39	31	3	19	2	3	3
Mont.	59	7	4	25	2	0	3
Neb.	38	40	2	12	2	3	2
Nev.*	0	0	1	98	0	0	0
N. H.	51	2	3	37	1	4	2
N. J.	22	1	2	73	0	0	2
N. M.	15	3	8	63	9	0	2
N. Y.	38	1	3	57	0	0	1
N. Car.	35	12	10	38	1	1	4
N. Dak.	61	19	3	7	3	2	5
Ohio	33	21	3	36	2	4	1
Okla.	38	9	5	44	2	1	1
Ore.	46	4	5	38	3	1	4
Pa.	42	3	4	44	0	3	3
R. I.	13	5	5	60	5	0	12
S. Car.	34	7	8	50	0	0	0
S. Dak.	32	49	2	8	3	4	1
Tenn.	48	7	7	36	1	0	0
Texas	39	5	5	43	3	3	2
Utah	62	8	4	22	1	2	2
Vt.	86	1	3	9	0	0	0
Va.	39	5	10	43	1	1	1
Wash.	37	2	4	53	1	0	2
W. Va.	52	4	5	35	1	0	3
Wis.	72	9	2	14	1	1	2
Wyo.	69	3	2	11	6	0	9

*Number reporting, 3.

Approximately 2,044 veterinarians returned questionnaires, about 200 of which were incomplete. This was an excellent response since over 33 per cent of those polled returned questionnaires. Also, it is nearly one-fifth of all the practitioners in the United States. The committee expresses its sincere appreciation to those practitioners who took the time from their busy lives to coöperate in this survey. We believe that the analysis of the replies received will be of sufficient interest and benefit to all practitioners and the profession to adequately repay them for their trouble. As will be mentioned later, this survey will undoubtedly lead to others and now that the value of these surveys is apparent, we trust veterinarians will continue their fine cooperation with this committee and others conducting polls.

The committee considered including Canadian practitioners in this survey, but decided that the conditions in the two countries were too variable. It would be better to conduct another poll of Canadian veterinarians with a questionnaire especially designed to meet their special needs. If Canadian members want a survey made, the committee will be glad to coöperate in conducting it.

The committee met on May 10, 1952, to study the analysis of the questionnaire and to decide on the method of publishing the data accumulated. After careful consideration and thorough discussion, it was agreed to submit the tables and discussion, as given below, as a supplement to the committee's 1952 report which was filed previously. After this report has been approved by the Executive Board and the House of Representatives, a series of articles based upon the results of this survey will be submitted to the JOURNAL for publication. They will be relatively short, concise articles, each discussing one phase of the data accumulated. Committee members have accepted responsibilities to prepare several articles, but urge other members to analyze this data carefully and to prepare articles for the

JOURNAL which will bring out other conclusions and findings.

This report does not pretend to present all the information that the 2,044 replies provide. The proposed JOURNAL articles will present other conclusions which can be drawn from the data accumulated. The information was placed on machine record cards and other analyses can and should be made. Some of the information produced by this survey will need to be refined and the committee will attempt to accumulate more information on some items.

The rapid increase in the human population of the United States, estimated to be about 2 million persons a year, would indicate that food production must be increased if the present human diet is to be maintained. One of the best ways to increase food production is to reduce losses caused by animal diseases. We believe veterinarians can contribute most to the reduction of these losses. The sparsity of veterinarians in some states in comparison with others indicates the need for many more practicing veterinarians. The committee believes that the accompanying tables show conclusively that many more practicing veterinarians are needed if the tremendous losses from diseases and parasites are to be significantly reduced.

The following comments on the survey for the AVMA were submitted by Mr. Milton E. Terry, Department of Statistics, and the Statistical Laboratory, Virginia Polytechnic Institute:

COMMENTS

The evaluation of the data presented in the tables (except for table 5) for all the states except Arizona, New Mexico, and Nevada can and should be made by the committee.

TABLE 3—Distribution of Total Gross Income from Practice Categories in Dollars by States (1950-1951)

State	Beef & dairy cattle	Swine	Horses and mules	Dogs and cats	Sheep and goats	Poultry	Others
Ala.	155,327	244,085	821,012	821,012	22,190	66,569	88,758
Ariz.	286,038	45,766	57,208	732,256	11,442	0	34,325
Ark.	386,662	43,773	29,182	240,752	14,591	7,296	0
Calif.	5,714,100	489,780	1,959,120	7,999,740	163,260	0	0
Colo.	1,204,380	150,548	90,329	1,294,709	120,438	30,110	90,329
Conn.	478,788	19,152	38,303	1,263,999	19,152	19,152	76,606
Del.	123,582	43,852	23,919	187,366	0	15,946	3,987
D.C.	0	0	0	1,142,856	0	0	11,544
Fla.	722,506	171,668	300,419	3,004,190	0	0	85,834
Ga.	1,190,013	649,098	288,488	1,334,257	0	0	108,183
Idaho	443,268	49,252	35,180	126,648	14,072	7,036	28,144
Ill.	5,173,315	4,382,079	295,618	4,138,652	147,809	147,809	147,809
Ind.	2,003,612	2,064,327	182,147	1,396,457	121,431	242,862	0
Iowa	4,869,579	8,731,658	335,833	1,343,332	335,833	1,007,499	167,917
Kan.	2,186,380	507,553	156,170	741,808	117,128	117,128	117,128
Ky.	979,133	191,570	383,139	532,138	42,571	0	0
La.	801,048	83,443	100,131	684,229	16,689	0	16,689
Maine	464,957	24,050	32,066	272,561	8,017	0	8,017
Md.	846,807	97,709	358,265	1,889,031	32,570	0	0
Mass.	389,396	55,628	139,070	2,113,864	27,814	0	55,628
Mich.	1,934,966	198,458	99,229	2,480,725	49,615	49,615	148,844
Minn.	2,603,849	2,095,781	127,017	952,628	127,017	254,034	190,526
Miss.	576,345	104,790	62,874	230,538	10,479	0	52,395
Mo.	2,135,855	1,697,731	164,297	1,040,545	109,531	164,297	164,297
Mont.	491,234	58,282	33,304	208,150	16,652	0	24,978
Neb.	2,009,136	2,114,880	105,744	634,464	105,744	158,616	105,744
Nev.	0	0	3,910	383,180	0	0	0
N.H.	318,648	12,496	18,744	231,176	6,248	24,992	12,496
N.J.	752,609	34,210	68,419	2,497,294	0	0	68,419
N.M.	149,625	29,925	79,800	628,425	89,775	0	19,950
N.Y.	4,046,373	106,484	319,451	6,069,560	0	0	106,484
N. Car.	655,428	224,718	187,265	711,607	18,727	18,727	74,906
N. Dak.	512,553	159,648	25,208	58,818	25,208	16,805	42,013
Ohio	3,385,767	2,154,579	307,797	3,693,564	205,198	410,396	102,599
Okla.	1,051,726	249,093	138,385	1,217,788	55,354	27,677	27,677
Ore.	1,062,554	92,396	115,495	877,762	69,297	23,099	92,396
Pa.	2,110,458	150,747	200,996	2,210,956	0	150,747	150,747
R.I.	36,498	14,038	14,038	168,450	14,038	0	33,690
S. Car.	521,424	107,352	122,688	766,800	0	0	0
S. Dak.	509,296	779,860	31,831	127,324	47,747	63,662	15,916
Tenn.	832,584	121,419	121,419	624,438	17,346	0	0
Texas	3,066,590	393,153	393,153	3,381,112	235,892	235,892	157,261
Utah	323,051	41,684	20,842	114,631	5,211	10,421	10,421
Vt.	510,625	5,938	17,813	53,438	0	0	0
Va.	923,442	118,390	236,780	1,018,154	23,678	23,678	23,678
Wash.	1,437,450	77,700	155,400	2,059,050	38,850	0	116,550
W. Va.	269,698	20,746	25,933	181,528	5,187	0	15,560
Wis.	2,936,340	367,043	81,565	570,955	40,783	40,783	81,565
Wyo.	373,222	16,271	10,847	59,659	32,541	0	48,812

These three western states show, in general, a practice largely dependent on small animals. The sample is small and might be suspected. There is one thing to note, however. If all the veterinarians in Arizona, Nevada, and New Mexico (86, 34, 52) were wholly large animal practitioners, the indexes (*see* table 5) for these states would still be extreme numbers and point to a very low density of veterinarians in those states. Hence, these high sample index numbers for the three states may not be as bad as one would fear.

Table 5 can be interpreted in conjunction with the other tables to give some idea of the crowded states and those in which considerable numbers of veterinarians can be adequately supported.

The use of the index should be made with care and common sense. The densely settled East with a higher animal value, small feedlots, etc., will not have the same critical index number as the range states. Comparison of index numbers must also take into consideration general use of veterinary services reflected in the average gross income for the states being compared, as well as the number of veterinarians available in those states.

For example, in a nonrange state, a high index number and low gross income indicate low intensity of usage or very low density of veterinary service available. Even if the over-all state density of veterinary service is good, it may be so distributed statewise as to give a poor cumulative effect on incomes and service.

TABLE 4—Total Value and Number of Livestock, Acres of Arable Land, Percentage of Practice with Large Animals, Estimated Gross Income from Large Animal Practice, and Average Value of Real Estate Owned by States (1950-1951)

State	Total val.[1] of livestock in 000's of $	No.[1] of livestock in 000's	Area of[1] arable land in 000's of acres	Pract. with large animals (%)	Est. gross income in 000's of $ from large animals	Average[2] value of buildings and land
Ala.	150,645	2,773	19,068	63	1,398	$16,022
Ariz.	103,424	1,341	37,856	36	418	29,536
Ark.	128,488	2,320	17,456	67	489	16,636
Calif.	433,304	5,276	35,054	51	8,280	29,500
Colo.	274,369	4,045	36,218	57	1,716	24,561
Conn.	34,475	220	1,593	34	651	25,757
Del.	10,323	110	923	53	211	23,125
Fla.	106,526	1,849	13,084	30	1,288	29,056
Ga.	154,142	2,973	23,676	63	2,272	17,020
Idaho	147,676	2,295	12,503	82	577	15,533
Ill.	651,454	10,306	31,602	72	10,642	19,968
Ind.	363,525	6,715	20,027	77	4,675	15,625
Iowa	1,022,035	17,727	34,454	92	15,448	11,177
Kan.	471,942	5,851	48,589	82	3,201	18,024
Ky.	240,457	4,099	19,725	75	1,596	22,940
La.	137,690	2,322	10,040	59	985	18,100
Maine	28,436	287	4,613	67	537	17,462
Md.	74,846	790	4,200	42	1,367	25,562
Mass.	40,180	311	2,078	24	668	19,080
Mich.	291,846	3,153	18,392	50	2,481	17,990
Minn.	590,057	7,672	33,140	85	5,398	21,844
Miss.	163,892	2,931	19,617	78	817	10,166
Mo.	502,910	8,350	35,278	81	4,436	15,164
Mont.	259,713	2,624	58,757	76	633	18,000
Neb.	574,502	7,159	47,533	88	4,653	14,540
Nev.	75,978	1,035	6,178	02	9	28,333
N.H.	17,958	146	2,017	63	394	20,143
N.J.	55,388	376	1,818	27	924	24,775
N.M.	169,417	2,712	36,218	37	369	31,000
N.Y.	385,687	2,624	17,568	43	4,501	17,726
N. Car.	149,937	2,235	18,618	62	1,161	15,685
N. Dak.	223,062	2,460	41,001	93	781	14,111
Ohio	381,395	6,461	21,928	64	6,566	19,197
Okla.	290,887	3,730	36,162	56	1,550	23,125
Ore.	138,887	2,015	19,754	62	1,432	19,813
Pa.	300,846	2,754	15,020	55	3,094	20,844
R.I.	5,730	37	265	40	112	13,500
S. Car.	75,303	1,161	11,022	50	767	25,269
S. Dak.	385,317	4,947	43,032	92	1,464	13,444
Tenn.	209,543	3,485	17,789	64	1,110	13,447
Texas	999,476	16,898	141,338	57	4,465	21,742
Utah	106,042	2,062	10,309	78	406	19,000
Vt.	64,846	483	3,391	91	540	16,000
Va.	181,566	2,436	16,358	57	1,350	29,179
Wash.	116,534	1,363	16,720	47	1,826	22,352
W. Va.	79,287	1,190	8,720	65	337	16,222
Wis.	704,906	3,538	23,615	86	3,507	13,239
Wyo.	162,408	3,075	12,503	89	483	17,136

[1]From the "U.S.D.A. Statistical Tables, 1950-1951."
[2]This is the average of those actually owning real estate used mainly for practice.

TABLE 5—Veterinarian Equivalent,[1] Index[2] Rating by States, and Rank of States by Index Number

State	Veterinarian equivalent[1]	Index[2]	Rank	State	Veterinarian equivalent[1]	Index[2]	Rank
Ala.	96	1,569	21	Nev.	1	75,978[3]	48
Ariz.	20	5,171	45	N.H.	27	665	3
Ark.	52	2,470	37	N.J.	82	675	4
Calif.	453	957	11	N.M.	16	10,589[3]	47
Colo.	105	2,613	39	N.Y.	447	863	9
Conn.	40	862	8	N. Car.	93	1,612	22
Del.	20	516	1	N. Dak.	59	3,781	42
Fla.	60	1,775	26	Ohio	525	726	7
Ga.	136	1,133	17	Okla.	98	2,968	40
Idaho	62	2,382	35	Ore.	90	1,543	20
Ill.	559	1,165	18	Pa.	326	923	10
Ind.	360	1,010	14	R.I.	8	716	5
Iowa	629	1,625	23	S. Car.	51	1,477	19
Kan.	263	1,794	28	S. Dak.	86	4,480	43
Ky.	104	2,312	34	Tenn.	82	2,555	38
La.	70	1,967	30	Texas	279	3,582	41
Maine	44	646	2	Utah	52	2,039	31
Md.	67	1,117	16	Vt.	62	1,046	15
Mass.	56	718	6	Va.	89	2,040	32
Mich.	300	973	13	Wash.	120	971	12
Minn.	315	1,873	29	W. Va.	48	1,652	24
Miss.	71	2,308	33	Wis.	419	1,681	25
Mo.	281	1,790	27	Wyo.	34	4,777	44
Mont.	50	5,194	46				
Neb.	240	2,394	36				

[1]The veterinarian equivalent represents the total veterinary medical service estimated available for large animal practice. For example, in Delaware, there are 45 veterinarians and the proportion of their income received from large animal practice would be equal to 20 practitioners devoting full time to large animal practice at the average net income of $6,589.

[2]The index is the value in thousands of dollars of farm animals which is estimated necessary to provide one veterinarian, with a 100 per cent large animal practice, the average gross income for all veterinarians in that state as shown by this study.

[3]Unreliable, extremely small sample.

TABLE 6—Number of Veterinarians Reporting Engaged Principally in Large Animal or Small Animal Practice[1] by States (1950-1951)

State	Large animal	Small animal	State	Large animal	Small animal
Ala.	26	4	Neb.	35	2
Ariz.	10	6	Nev.	0[2]	3
Ark.	10	2	N.H.	6	2
Calif.	60	74	N.J.	19	28
Colo.	31	14	N.M.	3	3
Conn.	26	16	N.Y.	53	33
Del.	8	2	N. Car.	34	6
D.C.	0	6	N. Dak.	17	2
Fla.	8	27	Ohio	67	15
Ga.	35	5	Okla.	31	6
Idaho	22	0	Ore.	34	8
Ill.	78	22	Pa.	67	27
Ind.	59	11	R.I.	3	2
Iowa	79	5	S. Car.	10	6
Kan.	61	5	S. Dak.	11	1
Ky.	30	6	Tenn.	18	5
La.	16	5	Texas	70	27
Maine	13	2	Utah	8	1
Md.	17	10	Vt.	13	0
Mass.	15	20	Va.	33	10
Mich.	30	13	Wash.	38	17
Minn.	67	4	W. Va.	9	2
Miss.	19	1	Wis.	74	5
Mo.	69	5	Wyo.	12	1
Mont.	10	4	Total	1,464	481

[1]Practitioners whose income from small animals does not exceed 50 per cent of their total were included as large animal practitioners.

[2]Only three replies received, all from small animal practitioners.

If one accepts the rule of 5 per cent farm animal value increase per annum, then one would, I think, consider a 5 per cent increase in the equivalent number of veterinarians normal. This increase, properly applied, should not affect the gross income estimates. When the increase exceeds this "mystical 5 per cent," there is considerable evidence to suggest that if the index is not reduced too much, the average gross will rise. Thus, we seem to have an anomaly which indicates that increasing the veterinary service available in a given state will tend to increase the return to all the veterinarians in that area.

In states of low density, this means simply that an increase in the veterinary population tends to reduce the amount of travel and other nonservice time over larger and larger areas, thus benefiting the public and the veterinarians.

Further, in states where the average gross income is satisfactory and encouraging and the index high, additional veterinarians should be encouraged to establish practices. Where the income is not satisfactory, relative to nearby states, several factors apparently can be operative singly or collectively. I list some of these and recommend the committee to add those others which may be pertinent.

1) The density of veterinarians may be below the critical level, reducing the effectiveness and income of the practitioner.

2) The distribution of practices may be unsound medically and economically.

TABLE 7—Distribution of Age Groups by States Within Regions (1950-1951)

State and region	Ave. age	No. D.V.M.'s rep.	Age groups: 20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 and up
Conn.	40	38	..	1	13	10	5	3	3	1	1	1	..	..	..	..
Maine	42	14	..	2	4	3	3	..	..	..	..	1	..	..	1	..
Mass.	39	34	1	4	8	6	10	2	..	1	2	..	..	..	..	..
N.H.	36	7	..	1	3	2	..	..	1	..	..	..	..	..	..	..
R.I.	49	8	..	..	3	..	2	..	..	..	..	2	1	..	..	..
Vt.	34	10	..	3	6	1	..	..	..	..	..	..	..	..	..	..
New Eng.	39.5	111	1	11	27	22	20	5	4	2	3	4	1	..	1	..
Median	36.5															
Del.	39	9	..	..	3	2	3	..	1	..	..	..	..	..	..	..
D.C.	38	6	..	..	4	..	1	..	1	..	..	..	..	..	..	..
Md.	39	25	..	5	7	5	3	..	2	..	2	..	1	..	..	..
N.J.	39	44	..	5	15	9	8	1	2	1	2	1	..	..	..	..
N.Y.	39	101	2	13	34	18	14	2	8	1	3	2	3	1	..	..
Pa.	40	109	1	14	29	18	19	7	5	5	7	1	3	..	..	..
Mid. At.	39.3	294	3	37	92	52	48	10	19	7	14	4	7	1	..	..
Median	36.4															
Ala.	39	33	1	14	6	2	1	..	..	3	2	2	2	..	..	..
Fla.	35	49	..	12	17	10	5	1	4	..	..	..	..	..	..	..
Ga.	36	40	1	8	16	5	4	1	1	3	..	1	..	..	..	..
Ky.	41	32	..	5	11	4	3	1	1	2	2	2	1	..	..	..
La.	43	20	1	1	16	5	2	..	..	1	1	1	1	..	1	..
Miss.	42	18	1	3	4	5	..	..	..	1	2	1	..	1	..	..
N. Car.	36	38	..	9	16	5	2	..	3	2	1	..	..	..	..	..
S. Car.	40	16	..	4	4	..	4	..	1	1	1	..	1	..	..	..
Tenn.	40	28	..	6	8	3	5	..	..	2	2	1	1	..	..	..
Va.	42	38	..	2	11	7	7	2	2	1	5	1	..	..	..	..
W. Va.	38	12	..	3	5	1	..	1	..	..	2	..	..	..	..	..
S. E.	39.2	324	4	67	104	47	33	6	12	16	18	9	6	1	1	..
Median	34.4															
Ill.	41	95	..	15	18	32	9	1	5	2	6	2	4	..	1	..
Ind.	47	68	..	8	18	7	8	2	2	5	9	4	4	1	..	..
Iowa	41	84	..	16	21	10	16	1	4	7	4	4	1	..	..	..
Kan.	41	60	..	15	20	2	5	1	5	2	4	2	2	1	1	..
Mich.	38	53	..	6	26	8	5	1	1	1	4	..	1	..	..	..
Minn.	41	71	..	9	24	10	8	2	8	2	2	5	..	..	..	..
Mo.	42	68	..	12	18	8	10	2	..	4	8	4	2	..	..	..
Neb.	38	34	..	9	10	3	5	2	1	2	1	..	1	..	..	..
N. Dak.	41	13	..	4	3	2	..	1	..	1	..	1	1	..	..	..
Ohio	40	76	..	10	27	11	9	2	4	5	5	2	..	1	..	..
S. Dak.	46	11	..	2	4	..	..	..	1	..	2	..	2	..	..	..
Wis.	40	79	..	17	28	6	9	2	3	1	6	7	..	..	..	..
Midwest	41.0	712	..	121	217	99	84	17	34	32	52	31	18	3	2	..
Median	35.9															
Ariz.	37	15	..	3	5	2	3	..	1	1	..	..	..	..	..	..
Ark.	44	14	..	4	4	1	..	..	1	1	..	1	1	..	..	1
N. M.	34	6	..	2	1	2	1	..	..	..	..	..	..	..	..	..
Okla.	40	35	1	3	16	2	4	2	..	3	1	2	1	..	..	..
Texas	35	93	3	30	27	15	8	..	..	1	5	2	2	..	..	..
S. W.	37.3	163	4	42	53	22	16	2	2	6	6	5	4	..	..	1
Median	33.4															
Calif.	40	130	1	12	46	24	19	6	6	6	8	1	..	..	..	1
Colo.	39	43	..	9	16	3	4	..	2	2	4	..	2	..	..	..
Idaho	40	24	..	7	7	3	1	1	..	1	..	2	1	..	1	..
Mont.	40	12	..	3	3	..	3	1	..	1	..	1	..	..	..	..
Nev.	35	3	..	..	2	1	..	..	..	..	..	..	..	..	..	..
Ore.	39	40	..	7	14	6	4	2	1	1	4	1	..	..	..	..
Utah	40	7	..	3	1	..	..	1	..	..	1	1	..	..	..	..
Wash.	39	53	1	8	24	4	7	2	..	3	..	3	..	1	..	..
Wyo.	40	12	..	2	5	3	..	..	1	..	..	1	..	..	..	..
West	39.2	324	2	51	118	44	38	13	15	14	17	10	3	1	1	1
Median	35.0															
U. S.	39.7	1928	14	329	621	286	239	53	86	77	110	63	39	6	5	2
U. S. Median	35.0															

TABLE 8—Distribution of Average Income from Participation[1] in Federal and State Disease Control Programs (1950-1951)

State	No. rep.	Ave. earnings from disease control	State	No. rep.	Ave. earnings from disease control
Ala.	33	$ 457.57	Neb.	34	$ 229.41
Ariz.	15	466.66	Nev.	3	000.00
Ark.	14	364.28	N. H.	7	301.42
Calif.	130	366.15	N. J.	44	350.00
Colo.	43	225.58	N. M.	6	000.00
Conn.	39	900.00	N. Y.	101	1,043.56
Del.	9	788.88	N. Car.	38	450.00
D. C.	6	333.33	N. Dak.	12	591.66
Fla.	49	130.61	Ohio	76	457.89
Ga.	40	600.00	Okla.	35	325.71
Idaho	24	1,370.83	Ore.	40	1,335.00
Ill.	95	640.00	Pa.	109	395.41
Ind.	69	218.84	R. I.	5	1,680.00
Iowa	84	180.95	S. Car.	16	312.50
Kan.	60	247.05	S. Dak.	11	.....
Ky.	32	259.37	Tenn.	28	1,300.00
La.	20	800.00	Texas	93	27.95
Maine	14	1,107.14	Utah	7	214.28
Md.	25	320.00	Vt.	10	1,940.00
Mass.	34	338.23	Va.	38	289.47
Mich.	53	266.03	Wash.	52	313.46
Minn.	71	378.87	W. Va.	12	433.33
Miss.	18	444.44	Wis.	79	1,286.07
Mo.	68	189.70	Wyo.	12	341.66
Mont.	12	308.33			

[1]Forty-four per cent of reporting veterinarians participate in state and federal disease control programs.

3) The farm public may need to be familiarized further as to services, general cost, and economic advantage. This should be undertaken either by local administrative organizations of the Association, or certain civic organizations such as the Ruritan Club, the Grange, or the Farm Bureau.

It is interesting to consider, with respect to table 5, the nine states which have operated veterinary colleges in excess of ten years. We note immediately that five (Ohio, New York, Pennsylvania, Washington, Michigan) rank 7, 9, 10, 12, 13, respectively, with a comparable index. These same states have about half of their service devoted to small animals.

The remaining four states (Iowa, Kansas, Colorado, Texas) form two distinct groups ranking [(23, 28) (39, 41)]. Iowa and Kansas are primarily large animal states, with 92 per cent and 82 per cent, respectively, of their practice in the large animal field. The wide difference in income (26,700 versus 13,500) is somewhat disturbing. Texas and Colorado both show 57 per cent of their comparable earnings from large animals. The index of both states is high, indicating a low density of veterinarians to animal population.

This report by no means wrings all of the data out of the questionnaire, but I believe that this report will furnish much useful information.

TABLE 9—Simple Correlation of Various Factors

Factor	Versus	Factor	Correlation
Ave. gross income from large anim. prac.		Value of livestock excluding poultry	$r = +0.62$
Ave. gross income from large anim. prac.		No. of livestock excluding poultry	$r = +0.63$
Ave. gross income from large anim. prac.		Total No. of veterinarians	$r = +0.24$
Ave. gross income from large anim. prac.		Area of arable farm land	$r = +0.31$
Total No. of veterinarians		Value of livestock excluding poultry	$r = +0.65$
Total No. of veterinarians		No. of livestock excluding poultry	$r = +0.55$
Total No. of veterinarians		Area of arable farm land	$r = +0.25$
Total No. of veterinarians		Ave. gross income	$r = +0.39$

GENERAL STATISTICS

1) Veterinarians who participate in state and federal disease control programs, 44 per cent.
2) Veterinarians who own buildings used mainly for practice, 75 per cent.
3) Veterinarians who own equipment, 95 per cent.
4) Veterinarians who have a source of income other than from practice, 67.6 per cent.

Simple correlation values are a mathematical attempt to measure the relationship between two factors. When two factors are completely linearly related, the correlation coefficient r will be ± 1. When r is positive, an increase in one factor yields an increase in the other; when r is negative, an increase in one causes a decrease in the other. A fair evaluation of the meaningfulness of r is to consider that $100r^2$ per cent of the variation in one factor is explainable by the other. Thus $r = +0.62$, when average gross income from large animal practice is compared with value of livestock excluding poultry, would indicate that in those states with a high value of livestock is found a high average gross income, and that about 38 per cent of the variation in average gross income is explained by the value of livestock.

In conclusion, I would like to commend the services of my statistical assistant, Mr. Douglas V. Hundley, to the committee.

Sincerely,
MILTON E. TERRY
Associate Professor,
Director of I.B.M. Studies

The committee recommends that a new special AVMA committee be appointed by the president to make a survey of the apparent increased dispensing and selling of drugs and/or biological products over the counter by practicing veterinarians, and a study of its long-range effects.

The committee urges the AVMA, through the Executive Board, to unite with other interested organizations and associations in the establish-

TABLE 10—Data Obtained from Modified Questionnaire Mailed to Practicing Veterinarians in Wisconsin and Ohio

	First Mailing	Second Mailing	Total
Ohio	116	53	169
Wisconsin	82	30	112

		Age in years		Years of practice		Years before retiring		Income from Practice: Beef cattle (%)		Dairy cattle (%)		Public health (%)	
		No. rep.	Ave.	No. rep.	Ave.	No. rep.	Ave.	No. rep.	Ave.	No. rep.	Ave.	No. rep.	Ave.
First	Ohio	115	43.78	114	17.23	76	21.63	81	15.37	84	43.45	25	26.24
	Wis.	80	38.48	79	12.61	60	23.98	58	5.02	73	81.73	15	32.33
Second	Ohio	52	42.85	52	16.50	35	21.94	35	15.40	40	45.53	6	19.00
	Wis.	29	48.52	29	22.52	21	18.95	11	6.45	24	88.92	6	9.50
Total	Ohio	167	43.49	166	17.00	111	21.73	116	15.38	124	44.12	31	24.84
	Wis.	109	41.15	108	15.27	81	22.68	69	5.25	97	83.51	21	25.81

		Expenses: Gross income (in dollars)		Drugs and biological products		Salaries (non-prof. employees)		Real estate tax, ins., per. prop. tax		Office and clinical (heat, lights)		Other business expenses	
		No. rep.	Ave.	No. rep.	Ave.	No. rep.	Ave.	No. rep.	Ave.	No. rep.	Ave.	No. rep.	Ave.
First	Ohio	94	19,281	84	7,164	54	2,269	70	344	77	879	61	2,651
	Wis.	69	15,829	65	4,878	39	1,031	56	486	63	797	51	1,643
Second	Ohio	42	18,298	38	7,174	31	2,061	31	342	32	691	30	1,770
	Wis.	25	14,524	24	3,975	11	1,945	19	342	21	514	12	1,800
Total	Ohio	136	18,977	122	7,167	85	2,193	101	344	109	824	91	2,360
	Wis.	94	15,482	89	4,635	50	1,232	75	449	84	726	63	1,673

		Net income		Total income tax		Miles travelled		Need for veterinarians			Returned previous questionnaire	
		No. rep.	Ave.	No. rep.	Ave.	No. rep.	Ave.	More	Fewer	Same	Yes	No
First	Ohio	94	8,879	70	1,824	94	27,749	18	17	76	71	36
	Wis.	69	8,314	61	1,892	70	29,540	23	3	50	54	22
Second	Ohio	42	8,243	30	2,097	41	24,605	5	9	35	19	28
	Wis.	25	8,296	16	1,256	25	28,572	7	..	21	10	11
Total	Ohio	136	8,682	100	1,906	135	26,794	23	26	111	90	64
	Wis.	94	8,310	77	1,760	95	29,285	30	3	71	64	33

The age of those from the second mailing from Wisconsin was higher than from the first mailing, but the reverse occurred for Ohio.

The first three headings are consistent, *i.e.*, a higher average age has a higher average years of practice, and a lower average number of years until retiring.

The average gross income from the second mailing was less than from the first mailing.

The returns from Wisconsin showed considerably more practice on dairy cattle than Ohio, but the reverse occurred for beef cattle.

The second mailing indicated less travel than the first.

There is a difference between the first and second mailing, and from this we conclude that there probably is a difference between these and the nonresponses.

ment of a department in the United States Department of Agriculture for the accumulation of morbidity and mortality statistics on food-producing animals.

Special Committee on Veterinary Service

s/E. J. FRICK, *Chairman*

C. D. VAN HOUWELING, *Secretary* W. T. OGLESBY

L. A. MOSHER I. D. WILSON

The data in tables 1 to 9 were obtained by scientific sampling of veterinarians. In order to further check the validity of these data, the committee mailed a modified questionnaire to all practicing veterinarians in two states, namely, Wisconsin and Ohio. The data obtained from this questionnaire are shown in table 10.

Self-Retaining Medullary Extension Splint

SALO JONAS, Dr. Sci. Nat., D.V.M., and ALBERT M. JONAS
New Haven, Connecticut

THIS REPORT is a sequel to the article "Self-Retaining Medullary Extension Splint,"[1] published in the JOURNAL in May, 1953. In recent months, changes have been made in the mechanics of the splint which make it safer and easier to use without affecting its basic principle.

The splint (fig. 1) is made of three separate parts, as described previously, but these are now conveniently assembled into a permanent unit and can be removed from the bone should the necessity arise. The cylindrical sleeve, made in various diameters and lengths, holds the spring and pin. One end of the sleeve (*see* fig. 1, *b*), against which the compression spring reacts, is closed, while the open end is crimped for ½ to 1 inch at a 90-degree angle to form a stop for the pin. Two tiny holes are bored close to the open end of the sleeve, into which a cotter pin (*d*) is inserted to hold the pin within the sleeve during reduction. No change has been made in the spring (*a*). The improved pin (c) is filed flat on one side throughout its length except for about ½ to 1 inch at the base, which is left round to form a shoulder which can not pass the crimp in the sleeve. The pin slides easily inside the sleeve and is quickly extended by the pressure of the spring when it is released.

The length and diameter of the sleeve is selected to conform to the length and diameter of the medullary canal of the longer fragment of the bone; the length of the pin portion which protrudes from the sleeve is governed by the length of the medullary canal of the shorter fragment. If the pin in the appropriate unit is too long, it can easily be cut, with bolt cutters, to any desired length and then filed to a proper point. It is important to have the pin long enough to allow good extension into the shorter, healthy section of bone fragment, while allowing at least 1 inch to remain within the sleeve. In order not to weaken the tension of the spring, and also to permit the correct measurements of the sleeve and pin, the unit (*e*) is assembled with the pin protruding from the sleeve to its full length.

When the appropriate unit is chosen for

Fig. 1—Illustration of the improved self-retaining medullary extension splint, showing (a) spring; (b) sleeve with crimped stop at one end; (c) pin filed flat, with shoulder stop; (d) assembled unit with cotter pin; (e) unit extended, showing spring and shoulder of pin stopped at crimped end of sleeve.

Dr. Salo Jonas is a small animal practitioner in New Haven, Conn.; Albert M. Jonas is a fourth-year student at the Ontario Veterinary College, Guelph, Ont.

the operation, the pin is pushed into the sleeve where it is held by the insertion of the cotter pin (*d*). The canal of the longer fragment is reamed out, the splint is inserted, and the marrow is sponged away to prevent fat embolism. When the shorter fragment is brought in apposition, the cotter pin is removed and the spring releases the pin which telescopes itself into the shorter fragment and automatically adjusts itself to the length of the medullary canal of the shorter fragment. The closed end of the sleeve is provided with a hole, and the tip of the pin with a hole or notch, for the insertion of a hook at either end, by which means the splint may be removed from the bone. The withdrawal of the splint would be made through an opening such as is drilled for the insertion of a single-pointed medullary pin.

Two representative fracture cases have been chosen to demonstrate the use of the self-retaining medullary extension splint. Radiographs were taken of one animal over a period of twelve months; the other, over six months.

Case 1.—This is the previously reported case[1] with a fracture of the tibia, with over-riding, in a 2-year-old smooth-haired Fox Terrier, and demonstrates successive stages of the repair six months and one year after the operation. A radiograph (fig. 2) taken Oct. 25, 1952, immediately following reduction with the original type of self-retaining splint shows the sleeve, spring, and pin partially within the sleeve in the distal fragment of the tibia and

Fig. 2 (Left)—Reduced transverse fracture of the tibia, showing the sleeve in the distal fragment, and the pin extending into the proximal fragment.

Fig. 3 (Right)—Six months later, the unit was in the same position as in figure 2. Note the healthy bone formation surrounding the pin.

the rest of the pin telescoped into the proximal fragment. Six months later, there was a dense, healthy bone formation surrounding the pin (fig. 3). A positive photograph of a radiograph (fig. 4) taken one year later, Oct. 17, 1953, shows no change in the position of the splint; a good calcified callus is evident, and no pathological change can be detected. Figures 2 and 3 show a slight curvature of the tibia due to the fact that the pin chosen was too short, with not enough of the pin remaining within the sleeve. This dog, observed for fifteen months after the operation,

Fig. 4—Positive photograph from radiograph of the same tibia (fig 3), taken one year after the reduction. There was no change in position of the splint; the callus was still normal.

Fig. 5 (Top)—Jagged, transverse, compound fracture of radius and ulna close to the epiphysis, with displacement and over-riding.

Fig. 6 (Bottom)—This radiograph, taken six days after reduction of the fracture (fig. 5), shows perfect setting of the radius. The sleeve, spring, and two-thirds of the pin are within the proximal fragment and one-third of the pin extends into the distal fragment. Note approximation of the ulna and the bandage over the operative area.

seemed to be perfectly sound and showed no sign of lameness.

Case 2.—An 8-month-old Collie bitch was submitted with a compound fracture of the radius and ulna. This is a type of fracture which is not adapted for setting with a straight medullary pin and is also too close to the distal epiphysis to permit plating. Repair of this fracture is illustrated in a series of five radiographs (fig. 5-9) taken over a period of six months. They show reduction of the fractured radius with the new type of self-retaining extension medullary splint, and the simultaneous repair of the ulna which, after being approximated, was immobilized by the splinted radius.

To reduce the fracture, an incision was made over the anterolateral aspect of the radius, and the extensor carpi radialis was separated from the deep digital extensor by blunt dissection, carefully avoiding injury to the blood vessels and tendons. The incision was extended sufficiently to permit exposure of both fractured ends of the radius and to allow for the insertion of the splint and the approximation of the fragments. After manipulating the ulna into good alignment and completing the operation, a simple gauze bandage, covered with waterproof tape, was applied for additional support until time for the sutures to be removed.

Figure 5, taken April 14, 1953, shows the jagged transverse fracture of the distal end of radius and ulna, with displacement and over-riding, before reduction. Six days after operation, a radiograph (fig. 6) showed a perfect setting of the radius with the spring and two-thirds of the pin within

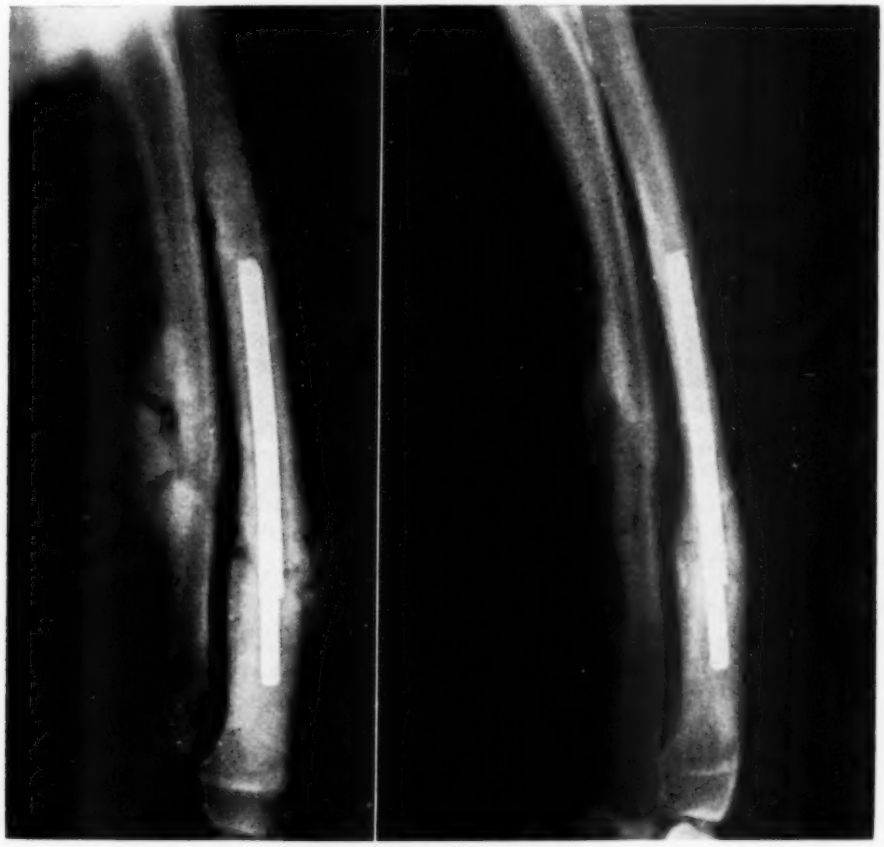

Fig. 7 (Left)—Thirty-one days after the fracture was reduced, the splint was in the same position, and there was normal temporary callus formation of the radius. The callus of the ulna was not quite as dense as that of the radius.

Fig. 8—The splint was in the same position eighty-one days after the fracture was reduced. The temporary callus of the radius and ulna had diminished and was approaching permanent callus.

the sleeve in the proximal fragment, and one-third of the pin within the medullary canal of the distal fragment. The splint in the radius and the supporting bandage gave adequate immobilization to the ulna.

Fig. 9—Six months after the reduction, the splint remained in the same position. The repair was complete, with healthy permanent callus. Note the clear space between the ulna and the radius.

A radiograph (fig. 7) taken thirty-one days after the operation showed that the splint was in the same position as in figure 6. There was a normal amount of temporary callus formation around the fractured area of the radius. The callus in the ulna seemed to be normal in size and similar in every respect to that in the radius except that it was not as dense and homogeneous.

Eighty-one days after the reduction (fig. 8), the fracture line at the posterior aspect was barely visible, the callus was diminished in size, and calcification was more dense and was becoming organized into a healthy, solid, permanent callus. The ulna had undergone similar changes but the distal fragment was not as dense as the proximal, which might have been due to the poor circulation in this region.

Six months after the operation, Oct. 14, 1953, a radiograph (fig. 9) showed no change in the position of the splint. The process of ossification and the repair of the fracture was complete, with a healthy, permanent callus.

The clear space between the ulna and radius (fig. 9) indicates that there was no fusion of the bones to interfere with rotation movements.

SUMMARY AND CONCLUSIONS

Two representative fractures are illustrated with radiographs taken at various stages to demonstrate the repair of bones with the self-retaining medullary extension splint. No unfavorable reaction or pathological changes can be detected, and there seems to be complete compatibility between splint and bone.

The self-retaining splint is not recommended for all fractures. In certain fractures a single,[2-3] double-pointed,[4] or Kuentscher[5] pin can be used to even better advantage. However, our experience has shown that it is the splint of choice in reducing fractures of the tibia, radius, and ulna, and also in cases where the bone is shattered near one end, or where the shorter fragment is too short or too weak for plating.

References

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[2]Brinker, W. O.: The Use of Intramedullary Pins in Small Animal Fractures. North Am. Vet., *29*, (1948): 292-297.

[3]Frick, E. J., Witter, R. E., and Mosier, J. E.: Treatment of Fractures by Intramedullary Pinning. North Am. Vet., *29*, (1948): 95-97.

[4]Jonas, S.: A New Method of Intramedullary Pin Fixation. J.A.V.M.A., *115*, (1949): 9-12.

[5]Jenny, J.: Kuentscher's Medullary Nailing in Femur Fractures of the Dog. J.A.V.M.A., *117*, (1950): 381-387.

Bitch Is Allergic to Contraceptive.—A 2-year-old Pointer, in estrus for a week, showed profuse slobbering, discharge from the nose, nervous chewing, and a temperature of 103.8 F. She was found to be allergic to a repellent type of contraceptive which the owner had been rubbing on her to keep males away.—*Southwest. Vet., Winter, 1954.*

Rupture of the Uterus in a Cow

J. R. GEORGI, D.V.M.

Ithaca, New York

A 4-year-old Jersey cow had evidenced signs of impending parturition for two days. Examination by the ambulatory clinician revealed a long rent in the roof of the left uterine horn with the fetus, which was apparently alive, lying in the abdominal cavity. The case was referred to the surgical clinic for correction.

The animal was prepared for a left flank, standing laparotomy; anesthesia was obtained by blocking lumbar nerves 2, 3, and 4. A 14-inch incision was made, starting 2 inches cranial to the left tuber coxae and 3 inches ventral to the lumbar transverse processes, extending downward and slightly backward. When the peritoneum was incised, about 2 gallons of straw-colored fluid escaped from the abdominal cavity. The calf was found lying on the floor of the abdomen bare of fetal membranes but still attached to the endometrium by the umbilical cord and was easily delivered alive by manual traction. The uterus was located, brought through the incision, and supported on a sterile towel. The fetal membranes were firmly adherent, so the umbilical cord was amputated with scissors. The rent, which extended nearly the full length of the left uterine horn and all but the caudal 2 inches of the cervix, was closed in two layers by continuous Lembert suture of No. 0 medium chromic catgut. The flank peritoneum muscles and fascia were approximated with No. 1 medium chromic catgut sutures, and the skin with a continuous vertical mattress suture of No. 0 monofilament dermalon.

After-care included supportive treatment and antibiotics. A baseball-sized seroma formed under the skin at the ventral end of the incision but after this was aspirated the wound healed by first intention.

Two months later, the owner reported that the calf remained vigorous and healthy until butchered at 6 weeks of age, and the cow was giving 30 lb. of milk per day; 10 lb. less than her previous maximum production.

This case is presented as a curiosity since a calf rarely survives rupture of the dam's uterus. How long the calf lay in the abdominal cavity is not known but it was at least two hours—the time which elapsed between diagnosis in the field and surgery in the clinic. It may have been considerably longer since there was no evidence of recent hemorrhage in the torn edges of the uterus.

Dr. Georgi is resident surgeon, Department of Surgery, New York State Veterinary College, Cornell University, Ithaca.

Hydrops Amnii in a Ewe

A 2-year-old ewe, due to lamb in a week, had a huge hernia-like swelling involving the entire left side of the abdomen. She was killed and the uterus was found to be tremendously distended with fluid, but 2 healthy lambs were delivered by cesarotomy. A 14-in. horizontal rupture was found in the ewe's left flank muscles.—*Iowa State Coll. Vet., 1954.*

Prolactin Potency of Hen Pituitary

The changes in prolactin potency of the pituitary of hens during periods of laying and of raising their young was studied. Using 38 old birds that had been broody several times, a suspension of the anterior pituitary body of each was taken at necropsy, the birds being destroyed at various stages of their cycle. The tests were made by studying the reaction of pigeons to injections of the pituitary extract.

The prolactin content of the pituitary usually was highest at the start of the broody periods; it dropped most rapidly at the end of brooding (at hatching time) and was lowest during the laying period.—*Bull., Japanese Nat. Inst. of Agric. Sci., G., March, 1954.*

Equine Cystic Ovariectomy

A 10-year-old rodeo mare exhibited posterior lameness which increased with exercise. Rectal palpation revealed a large mass attached near the kidneys. After a 24-hour starvation period and the routine technique, a cystic ovary of near basketball size was removed through an 18-in. incision in the left flank. Recovery was uneventful.—*Southwest. Vet., Winter, 1954.*

Ruptured bladder is seen occasionally in foals and is remedied by a relatively simple operative technique.—*W. R. McGee, D.V.M., Kentucky.*

A Simplified Method of Surgical Correction of Prostatitis of the Dog

G. S. McKEE, D.V.M.

Washington, Pennsylvania

It has been demonstrated in cases of canine prostatitis that surgical intervention is the proper procedure. This is usually accomplished by performing a laparotomy, then incising the capsule of the diseased gland.

Most dogs presented for treatment are old, toxic, and not good risks for prolonged general anesthesia and surgery. Therefore, we propose the following simplified method.

The rectum is emptied by means of an enema, and the perineal area is clipped, washed with soap and water, wiped dry with ether, and painted with iodine.

For general anesthesia, ether or a barbiturate of choice, sufficient to effect the desired anesthesia, is satisfactory.

For local anesthesia, a 2 per cent procaine hydrochloride, a 10-cc. syringe, and a spinal needle (the type used on human beings) about 4 inches long can be used. The needle should penetrate the skin about 1 cm. below the anus, 1 cc. being deposited subcutaneously. Placing a gloved left forefinger in the rectum, guide the needle forward, depositing procaine in the pararectal tissues until the prostate is reached.

The needle should then be passed into the left lobe of the prostate and 2 cc. of procaine deposited; the same amount should be deposited in the right prostate.

With the finger still in the rectum, make a small incision on the ventral side of the anus at the medial line.

Secure the prostate with the left forefinger and pass a probe-pointed bistoury, similar to the small one used in teat surgery, through the incision until the left lobe of the prostate is reached. Force the bistoury through the posterior wall of the gland, about two-thirds of the way up, then pass it through the gland until the point can be felt at the anterior extremity with the finger, where it again is forced through the capsule and by cutting upward the capsule is incised from the posterior to the anterior puncture. Then withdraw the bistoury from the left lobe and repeat the procedure on the right lobe.

If this procedure is followed, the prostate gland will become soft and pliable and, within eight days, all the symptoms of the condition will have subsided and will not recur.

One advantage of this procedure is that it can be done in the office, the patient may be sent home, and will not need to be returned for dressings or suture removal. If the prostatitis is of an infectious nature, antibiotics may be given at the time of the operation.

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Torsion of the Bovine Cecum

A 3-year-old cow had been off feed for five days and for ten days had passed only watery feces but she showed discomfort only when urinating. Rectal palpation revealed a greatly distended cecum and tension of the dorsal mesentery. On laparotomy through the right paralumbar fossa, the cecum was found to be three times its normal size with a constriction at its junction with the ileum and colon.

Before the cecum could be manipulated, it was necessary to empty its fluid content by incising the wall. After closing the incision with Lembert sutures, the mass was revolved and the constriction relieved. In two days, she started to pass feces and made an uneventful recovery.—*Iowa State Coll. Vet., 1954.*

Effect of Sex Hormones on Sows

When 217 sows were given 500 I.U. of chorionic gonadotrophin, 84.6 per cent developed estrus, 58 per cent became pregnant, with litters averaging 9.7. When 170 sows were given 400 to 800 I.U. of chorionic gonadotrophin with an equal dose of pregnant mare serum, 95.8 per cent developed estrus, 82.2 per cent became pregnant, with litters averaging 9.9. When 5 to 30 mg. of stilbestrol was given to each of 362 sows, 65.4 per cent developed estrus, 38.3 per cent became pregnant, and litters averaged 6.2; however, in 72, estrus was thereafter irregular and 65 had no further estrus.—*Vet. Bull., Feb., 1954.*

The incidence of prostatitis and dermatitis could be greatly reduced in old male dogs by castration at the age of 8 years.—*R. B. McClelland, D.V.M., New York.*

CLINICAL DATA

The Diagnosis and Treatment of Diabetes Mellitus in the Dog

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DIABETES MELLITUS is considered to be a rare disease of dogs. In a comprehensive review of the literature, Schlotthauer and Millar,[1] who found 21 cases described previously, indicate that the incidence of the condition in dogs is slightly less than 1 in 1,000. It has been said, however, that the number of cases of diabetes mellitus in any population is almost directly proportional to the quantity of Benedict's solution used in looking for them. In finding the 10 cases described below, an estimated 2,000 urine samples were examined. These could not be termed routine urinalyses, since examination was performed for diagnosis, or confirmation of diagnosis, in sick animals.

Diabetes mellitus is a hereditary disease in which sugar is excreted continuously in larger or smaller quantities in the urine and is also present in increased amounts in the blood. There exists a deficiency of insulin resulting from malfunction of the islands of Langerhans in the pancreas.

Polyuria is usually the first symptom noticed for, in order for the kidney to dilute and eliminate the excess sugar brought to it through the blood stream, large amounts of water must be drawn from the tissues and passed as urine. Polydipsia, or excessive thirst, follows. The patient becomes weakened because he can not properly utilize either sugar or fat in the blood stream, and hence starves amid an abundance of food. Therefore, polyphagia, or excessive hunger, appears. Localized or generalized pruritus, eczema, carbuncles, slowly healing ulcers, or disturbances of vision can occur. As the disease progresses, acidosis becomes more severe, and the carbon dioxide-combining power of the blood is reduced. Vomiting, a consequent reduction in sodium chloride and electrolyte concentration, lowered alkali reserve, diuresis, and dehydration, lead to hemoconcentration. The pH of the blood shifts toward the acid side, and Kussmaul-Kien respiration or "air hunger" follows. Then, finally, there is circulatory collapse, depression of renal activity, retention of nonprotein nitrogen in the blood, subnormal temperature, and death.

The immediate cause of diabetes mellitus is a deficiency of endogenous insulin, but the basic cause is not known. Heredity and overweight are definite factors. There is a close inter-relationship between the pituitary gland and the pancreas, and between the adrenal glands, thyroid gland, and the pancreas. Infection and disease, resulting in injury to certain areas of the midbrain, may play a part. Diabetes mellitus of dogs more commonly affects females than males, as is borne out by the review[1] mentioned above.

An outline of the cardinal symptoms of 10 cases is shown below; constant in all animals was polydipsia, polyuria, and polyphagia. The essential laboratory findings are shown in table 1.

CASE REPORTS

Case 1.—A 10-year-old female Fox Terrier-type mongrel, with an initial weight of 31.5 lb., showed a marked loss of weight for three months; some vomiting and a heart murmur were also present. Other physical findings were essentially normal.

Treatment.—Insulin, 5 units once daily, finally increased to 16 units, was given one-half hour before the evening meal. The food intake was increased to approximately 1,000 calories daily to maintain weight at 30 lb. After four months of treatment, insulin was discontinued. The dog was in good health for two months but, on return of

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The author is indebted to Dr. Mark L. Morris for constructive criticism, and to Lois Simmons and Dolores Biggs for invaluable assistance in preparation of this paper.

diabetic symptoms, therapy was reinstituted. Two months later, a sudden collapse occurred, accompanied by severe bloody diarrhea and death in two days. The cause was not definitely determined, as a postmortem examination was not permitted.

Case 2.—An 8-year-old daughter of the above dog, weighing 28 lb., showed a moderate loss of weight for a month. Other findings were normal.

Treatment.—Twenty units of insulin was given once daily. When the dog's weight dropped to 23 lb., insulin was increased to 36 units daily. The weight increased to 25 lb.; urine sugar and acetone were negative. When insulin was reduced to 36 units every other day, loss of weight again occurred and clinical symptoms returned. It seemed difficult to standardize this patient, perhaps because of some violation of diet rules. The weight finally declined to 20 lb. Severe anemia ensued, with a hemoglobin determination 30 per cent of normal, and in spite of intensive therapy, including blood transfusion, death occurred six months after the diagnosis. Necropsy was not allowed.

Case 3.—A 7-year-old female Cocker Spaniel had lost weight for six months, vomited frequently, was listless and thin, and had a generalized scaly skin. It was difficult to raise a vein to draw a blood sample.

Treatment.—Apparently an advanced case and a poor subject for treatment, she did well on 25 units of aqueous insulin daily. Her skin and weight became normal.

Case 4.—An 8-year-old female Cocker Spaniel, when presented for surgical removal of a mammary tumor and routine urinalysis, was found to have glycosuria. Polyuria, polydipsia, and polyphagia were present to a moderate degree.

Treatment.—Insulin, 20 units daily, was prescribed. She maintained a weight of 20 lb. when her ration was adjusted. When the tumor was removed, the wound healed well by first intention. Three months later, when a painful tumor became evident in the right axillary space, euthanasia was performed. This tumor proved to be nonmalignant.

Case 5.—An 11-year-old female German Shepherd, weight 55 lb., was thin and listless, with a harsh, dry coat, and a marked odor of acetone on the breath. Bilateral cataracts had appeared about six months previously, and a small ulcerated mammary tumor was also present.

Treatment.—Ten units of insulin in the morning and 40 units in the evening proved adequate. On a proper ration, her weight rose to 73 lb. (about normal), the ulcer healed, and the coat became normal. After eight months, a painful growth developed near the right axillary region, somewhat similar to case 4. She was destroyed but necropsy was not possible.

Case 6.—An 8-year-old female mongrel was very obese when presented for treatment of hematuria. A routine urinalysis revealed glycosuria. Euthanasia was requested.

Case 7.—A 13-year-old male mongrel showed moderate loss of weight for about three months, was lethargic, vomited occasionally, and had a pronounced cardiac insufficiency. Euthanasia was requested.

Case 8.—An 11-year-old female Dachshund showed a marked loss of weight for

TABLE I—Laboratory Findings in Ten Cases of Diabetes Mellitus

Case No.	1	2	3	4	5	6	7	8	9	10
Urine										
Specific gravity	1.030	1.040	1.030	1.040	1.035	1.030	1.040	1.012	1.018	1.040
pH	6.0	5.0	6.0	7.0	6.0	6.0	7.0	6.0	6.0	5.0
Color	Light yellow	Light yellow	Color-less	Light yellow	Light yellow	Reddish brown	Light yellow	Light yellow	Light yellow	Light yellow
Albumin	2 +	Neg.	3 +	2 +	2 +	1 +	3 +	2 +	1 +	2 +
Sugar	over 2%	over 2%	over 2%	over 2%	over 2%	over 2%	over 2%	over 2%	over 2%	over 2%
Acetone	4 +	4 +	4 +	4 +	4 +	4 +	4 +	4 +	4 +	4 +
Centrif. sediment	Neg.	Neg.	Few small coarsely granular casts	Few small coarsely granular casts	Neg.	Many r.b.c.'s	Neg.	Neg.	Neg.	Neg.
Fasting Blood sugar mg./%	310.5	298.92	318.15	297.2	254.66	228.0	Not done	Not done	Not done	295.0

one month but was still in good condition. She had eczema near the flank regions.

Treatment.—In this instance, 30 units of protamine zinc insulin was given one-half hour before the evening meal. Some polyuria and polydipsia continued, but the dog seemed well clinically, maintained her weight, and diabetes was under fair control after five months.

TABLE 2—The Effect of Improper Insulin Dosage

Too little insulin	Too much insulin
Excessive thirst	Normal or less than normal consumption of water
Vomiting	Usually no vomiting
Lethargy	Trembling and nervous
Urine sugar positive	Urine sugar negative
Urine acetone positive	Urine acetone negative
Diabetic coma	Insulin shock
Onset slow	Onset sudden
Dehydration	Normal hydration
Deep breathing	Shallow breathing
Rapid pulse	Normal pulse
Acetone breath	Normal breath
Membranes red	Membranes pale

Case 9.—A 10-year-old female Cocker Spaniel weighed 27 lb. when first seen and, although she was in fair condition, she was listless and had some posterior weakness.

Treatment.—Aqueous insulin, 20 units in the morning and 40 units in the evening, was prescribed. After two weeks, the insulin was decreased to 10 and 20 units, respectively.

After five months she showed a weight increase to 32 lb., appeared well and energetic. A small mammary tumor was evident.

Case 10.—A 12-year-old male mongrel appeared well except for loss of weight, polydipsia, polyphagia, and polyuria. Euthanasia was performed because of difficulty in handling.

DISCUSSION

A mother-daughter relationship between cases 1 and 2 parallels the hereditary factor known to be present in human diabetes. When albumin was present in the urine, it disappeared after treatment. The albumin often present in the urine of diabetic victims does not necessarily indicate nephritis. All animals in this report were 7 years of age or older, suggesting that diabetes in the dog is more common past middle life. Two patients were overweight before the onset of clinical diabetes; obesity may be a factor in the dog.

The importance of urinalysis can not be overestimated. It is also advisable, wherever possible, to have a fasting blood sugar determination to confirm the diagnosis. Dextrose tolerance tests can also be made, but the writer has not used this procedure.

Once the diagnosis has been confirmed, a forthright explanation of the necessary regimen must be given the owner. With treatment of diabetes in man so common, most individuals readily understand the dietary regulations and the necessity for insulin administration. Of the 10 cases described, 7 owners elected to treat their animals. Six learned to administer the insulin at home, while one brought the dog to the office daily. Even with rather complicated diets, no difficulty was experienced.

Insulin is available as an aqueous solution of the active antidiabetic principle derived from the islands of Langerhans of the pancreas; as zinc insulin, a more purified form of aqueous insulin; and as protamine zinc insulin. The effect of aqueous or zinc insulin comes rapidly and lasts for five or six hours; that of protamine zinc insulin has a duration of twenty-four hours or more. Waddington[2] described the treatment of diabetes mellitus in a Fox Terrier with a single dose of aqueous insulin given twenty minutes before the daily meal. Since little other information was found in the literature, a procedure had to be evolved.

The aqueous form of insulin was used because with protamine zinc insulin the animal might suffer insulin shock during the night, or at a time when it was not attended. In most instances, the dogs were fed in the morning and evening, for it seemed desirable to allow them to gain as quickly as possible some of the weight they had lost. The initial dose of insulin, to bring the diabetes under control, was usually larger than the maintenance dose used later. In general, a 20-lb. dog required a 10- to 30-unit dose fifteen to thirty minutes before the evening meal. It is usually undesirable to strive for a negative urine sugar as this may require too much insulin, but a negative urine acetone should be achieved. Good criteria of adequate treatment, readily determined, are water consumption and body weight. If the diabetes is controlled, the excessive thirst will disappear, and the animal will gain weight.

The determination of an adequate diet presents a unique problem. Kirk[3] recommended a diet of fat meat, eggs, milk, or fish, excluding all starchy foods. He states

that horse meat should be prohibited, but makes no reference to the use of insulin in conjunction with the diet. Schnelle[4] described a case where treatment was started with insulin and raw pancreas and then successfully continued with a diet consisting only of frozen raw horsemeat, without insulin.

The adult human diabetic doing light work is usually given 30 calories of food per kilogram of body weight daily. This was tried with the first canine case but, although physical condition improved, the dog continued to lose weight. Caloric intake was, therefore, increased until 60 calories per kilogram of body weight daily was found sufficient for weight maintenance. The diet of the first patients consisted chiefly of meat, cottage cheese, eggs, milk, whole wheat biscuit, and vegetables. Later, a beef and cereal base canned dog food was prescribed for 2 dogs, with the proper dose of insulin. The results were good in 1 patient, but unsatisfactory with the other.

A convenient, twice-daily procedure was later evolved. For a 20-lb. dog, the morning meal consisted of ½ pint of whole milk and ½ cup of cottage cheese; for the evening meal, 1 cup of cooked or raw horsemeat, ½ cup of kibbled biscuit, 1 tablespoonful of fat with cooked, nonstarchy vegetables added if desired. This, with 10 units of aqueous insulin in the morning and 20 units in the evening, was found satisfactory, with some individual variations. It is also desirable to supplement the daily vitamin intake.

Of 8 cases of diabetes mellitus reported by Milks and Stephenson,[6] 6 showed complete atrophy of the pancreas at necropsy; 2 showed almost complete atrophy; and 1 had a normal pancreas. Schlotthauer and Millar[1] reported the pancreases atrophied in 4 of 6 diabetic patients. It was possible to necropsy only 6 of the 10 cases described here, but the pancreas in each instance was apparently normal in size. Two were sectioned, using Zenker's fixation, hematoxylin, and eosin stain. The pathologist reported that in one case the islets of Langerhans of the pancreas appeared to be diminished in number and volume, and the areas which apparently were islets showed vacuolated cells. In the second case, there was almost an absence of islet tissue. Such remnants as could be identified were composed of connective tissue.

SUMMARY

The diagnosis of diabetes mellitus in the dog is not a difficult matter, for the symptoms are easily recognized and diagnosis can be confirmed beyond question in the laboratory. Treatment is not quite as simple, for cases vary considerably with respect to severity and the dosage for each must be adjusted for the individual patient. If the coöperation of the owner can be secured, and the veterinarian supplies the necessary supervision, the treatment of diabetes mellitus in the dog is feasible and can be successfully carried out.

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Aldrin and Dieldrin as Acaricides

The *gamma* isomer of benzene hexachloride (BHC), because of its acaricidal efficiency and its low toxicity for warm-blooded animals when used as a 125 p.p.m. dip solution, has been preferred for treating scab in livestock, including sheep infected with *Psoroptes communis ovis*. When dieldrin wettable powder at 0.05 per cent concentration was used on infested sheep, all signs of skin irritation disappeared almost immediately. However, aldrin, either as a wettable powder or as an emulsifiable concentrate at 0.05 per cent concentration, failed to effect a complete cure. Dieldrin at 0.03 per cent concentration was equal in efficiency to BHC wettable powder at 0.02 per cent of the *gamma* isomer but getting dieldrin into suspension was much more difficult.—*Onderstepoort J. Vet. Res., Nov., 1953.*

The swine erysipelas organism is frequently cultured from arthritic joints of hogs 2 to 3 or more months of age.—*L. P. Doyle, D.V.M., Indiana.*

Disease Problems in Chinchillas

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THIRTY YEARS ago, the chinchilla was practically unknown in the United States, but today it is estimated that there are over 100,000 animals in this country. In spite of the rapid increase, little scientific information is available on this South American rodent. Nutritional requirements have not been established, and comparatively little is known about breeding and pathology.

While conducting nutritional experiments, our work was originally hampered and ultimately stopped by disease, as the herd was virtually wiped out by an enteritis of bacterial origin. The experimental diets were not found to be implicated, at least not directly, and the nutritional findings are being reported elsewhere.* The work reported here was undertaken not with the view of investigating pathological conditions *per se*, but with the immediate objectives of ascertaining the cause of disease, and improving our laboratory conditions in order that disease might be eradicated and nutritional work continued.

We succeeded in isolating and identifying two organisms which we believe were responsible for the losses. We also encountered two other pathogens of apparently secondary importance. Therefore, in order to clarify the presentation of material, we have used two subheads, "Primary Pathogens" and "Secondary Pathogens." The first term refers to the bacteria *Pseudomonas aeruginosa* and *Proteus mirabilis;* and the second term to the molds Trichophyton and *Aspergillus flavus.*

EXPERIMENTAL

Care of Animals.—At the start of our experimental work, we had 67 chinchillas ranging in age from 2 to 9 months. The animals, which had been received from various parts of the country, were all reportedly healthy and presented a good appearance. They were housed on one side of a laboratory about 24 ft. square, the other side being occupied for the most part by white rats.

The chinchillas were housed individually, some in metal cages, 15 by 29 by 18 in., and some in wooden cages measuring 10 by 20 by 20 in. All cages were floored with metal screen so that the droppings fell through the openings onto trays of wood shavings. Dust baths of fuller's earth, containing 0.1 to 1.0 per cent spergon,** were provided once or twice weekly. When there was evidence of eye infection, a generous portion of sulfathiazole was added to the dust bath mixture.

The temperature was kept as close to 68 F. as possible, although it could not be maintained constant until an additional temperature control unit was purchased several months after work was initiated. Chinchillas are said to do best at temperatures between 50 and 60 F.[1] We compromised at 68 F. in order to accommodate other animals in the laboratory. Each chinchilla was provided with its own feeding bowl, inverted water bottle, and a small block of hard wood to chew on as compensation for a soft ration. In the preëpizoötic period, all sick animals were examined by a veterinarian and treated in accordance with his directions.

PRIMARY PATHOGENS

Mortality.—During the preëpizoötic period, the average death rate was 1 every twelve days. During the epizoötic, which lasted approximately thirty-nine days, there were 34 deaths. Following this period, there were no deaths for sixty-nine days. Mortality then increased to an average of one death every five days for six weeks and again dropped off to approximately one every three months. The total mortality for twenty-two months was 92 per cent. Deaths and causes for the first year are shown in table 1.

Gross Pathology.—The most outstanding epizoötic symptoms observed in the 20 animals necropsied in our laboratory were as follows: At dissection, a strong putrid odor was emitted from the abdominal cavity. The stomach was always inflamed and lined with mucus. Often it was filled with slimy contents. Fur balls (trichobezoars) were

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*Larrivee, Gertrude P., and Elvehjem, C. A.: Studies on the Nutritional Requirements of Chinchillas. J. Nutr., 52, (March 10, 1954): 427-436.

**We are indebted to the U. S. Rubber Company, Naugatuck, Conn., for supplies of purified spergon.

Fig. 1—Animal 24, showing liver, stomach, and intestines. The liver lobes have been reflected to expose the speckled ventral surface. The stomach is distended. The small intestine on the left (arrow) is hyperemic, atonic, and filled with orange mucoid material in contrast to the large intestine (right) which is comparatively normal.

Fig. 2—Animal 24 necropsied and photographed immediately after death, showing hyperemic lung (arrow), speckled liver, and distended stomach.

found in the stomachs of one third of the animals.

The small intestine, starting from the pylorus and extending for 2 or 3 ft., was always acutely inflamed. The tissue was soft and spongy and tore easily. The lumen characteristically contained an orange-yellow mucous fluid. Microscopic examination of the fluid from 1 animal revealed the presence of erythrocytes, pus cells, and bacteria. In about a quarter of the animals, the large intestine appeared to be free of inflammation. In half of the animals, a large amount of gas was present in the intestines and occasionally, shortly before death, the gait was seen to be affected due to the swelling of the abdomen. In several instances, numerous white dots, enlarged Peyer's patches, or small ulcers were observed in various parts of the intestine.

The lungs never appeared normal. They were usually blotchy red and gray although consolidation was not apparent, *i.e.*, large pieces of lung tissue floated in water.

In half of the animals, the liver capsule appeared speckled or mottled (fig. 2), but the exact nature of the mottling was not established. The liver was usually deep red, rarely icteric, the mottling being white or light gray.

The genital organs were sometimes extremely inflamed. This probably accounts for the fact that not 1 of 9 females paired with males bore young.[2,3] In approximately a third of the bodies, the bladder was filled or distended with urine. Figures 1 through 4 illustrate some of the pathology described.

Constipation was common during the epizoötic. Several animals produced no visible droppings for as long as four to five days. Many formed small, shriveled, hard pellets, but occasionally diarrhea occurred just before death. Blood was sometimes found on the feces, and gas bubbles were frequently observed on the pellets of animals consuming rations high in cellulose.

Histology.—Histological studies were made by H. J. van Baaren, M.D., of the Pathology Department of the Medical School, on tissues from 10 chinchillas. Five had died before the epizoötic, 3 during the epizoötic, and 2 afterward.

The general histological picture of all 10 animals was one of severe congestion of various organs including the intestine, liver, lungs, kidney, and spleen. The in-

TABLE 1—Mortality and Causes in Chinchillas

Month (1952)	No. of deaths	Cause of death: Enteritis	Suspected enteritis	Gastritis	Pneumonia	Misc.	Unknown
Jan.	1	....	....	....	....	....	1
Feb.	1	....	....	....	....	....	1
March	4	....	....	....	1	....	3
April	2	....	....	1	....	Spergon poisoning	....
May	5	....	....	1	3	....	1
June	2	....	....	....	....	Ruptured cecum	1
July	2	....	....	1?	....	Accident	....
EPIZOÖTIC							
Aug.	23	19	1	....	....	....	3
Sept.	12	....	9	....	1?	....	2
Oct.	0	....	....	....	....	....	....
Nov.	2	1	....	....	....	Ruptured colon	....
Dec.	4	4	....	....	....	....	....
Totals	58	24	10	3	5	4	12

Animals referred to under "suspected enteritis" were not necropsied, but either or both primary pathogens were isolated from feces and/or drinking water bottles.

testine was hyperemic and round cell infiltration of the mucosa was evident in a number of instances. Diffuse fatty changes of the liver were noted in 4 cases, focal hepatitis in 1, atrophy of the liver cells in 1, and thickening of the capsule with subcapsular lymphocytic infiltration in 1. Bronchopneumonia was diagnosed in 2 cases, and hemorrhage of the lung was obvious in 4 others. Fat cells were observed in the adrenal cortex in 5 instances and in 4 of these there were also large numbers of pigmented macrophages present in the spleen. Of all the organs observed, only the heart appeared unaffected.

A guinea pig housed in the chinchilla laboratory died shortly after the epizoötic reached its height. Microscopic abnormalities in this animal were similar to those observed in the chinchillas. Acute hyperemia was visible in the liver, kidney, and intestine; and pigmented macrophages were found in the small intestine, adrenals, and spleen. The heart was normal.

Hematology. — Hematological examinations were included in the study of the disease syndrome. Table 2 represents the blood picture of animals which died during the epizoötic and from which blood was taken within two weeks of death. Thus, the values recorded undoubtedly reflect the response of the blood tissue to infection. Under "Medication" are listed the drugs which the animals were receiving at the time blood was drawn. Rachman,[4] working with 10 normal chinchillas, reports a leukocyte range of 5,500 to 9,000 and a lymphocyte range of 31 to 57 per cent. In comparison with these figures, the animals represented in the table, with one exception, show both a leukocytosis and a lymphocytosis. However, since only two reports have been found in the literature concerning the normal blood picture of the chinchilla, no other comment is offered.[4,5]

Bacteriological Methods.—Bacteriological studies were started in our laboratory after the State Disease Control Laboratory reported that some of our chinchillas showed evidence of bacterial infection. The bacteriological medium** employed was designed for the selective isolation of the more common enteric pathogens. Fecal and organ samples were inoculated into tetrathionate broth. After incubation at 37 C., the broth was streaked onto SS (Salmonella-Shigella) agar plates. Isolated colonies were then picked onto triple sugar iron agar slants. The organisms were identified by their carbohydrate metabolism. Proteus organisms were further checked by inoculating urea broth with the pure colonies from the sugar slants. The green pigment produced in the tetrathionate broth

**Supplied by Difco Laboratories, Detroit, Mich.

TABLE 2—Hematological Values for 6 Chinchillas Dying During the Epizootic Period

Animal (No.)	Date (1952): blood examined	Date (1952): animal died	Medication	Erythrocytes 10^6/cmm.	Hemoglobin Gm./100 ml.	Leukocytes 10^3/cmm.	Leukocytes (%): Neutros.	Lymphos.	Monos.	Eos.	Basos.	Other
10	7/28	8/8	....	7.74	13.4	16.2	10	79	6	....	....	5
47	7/29	8/8	....	8.02	11.8	15.3	17	65	....	....	....	18
24	8/2	8/14	....	9.48	14.2	10.4	9	89	1	....	1	....
6	8/15	8/25	Sulmet aureomycin (8/11)	Not counted	14.5	9.15	22	69	5	4	....	....
21	8/15	8/29	Sulmet aureomycin	6.34	10.7	18.0	5	87	7	....	1	....
51	8/16	8/29	Sulmet	7.98	16.0	5.70	43	51	7	1	1	....

by *Ps. aeruginosa* was further checked by the solubility of the blue and yellow components (pyocyanine and fluorescein) in chloroform and water, respectively.[6]

Etiology.—Both our laboratory and the state laboratory established that the chinchillas were infected with *Ps. aeruginosa* and an organism later identified as *P. mirabilis.* During the epizoötic, the state laboratory necropsied 8 of our animals and reported bacteriological results as follows: 3 animals, *Ps. aeruginosa and P. mirabilis*†; 4 animals, *Ps. aeruginosa;* 1 animal, *P. mirabilis.*† Table 3 lists the bacteriological findings of our laboratory for 7 chinchillas which were necropsied immediately after death or put in cold storage and necropsied the next day.

Fecal cultures were run at various times during and subsequent to the epizoötic. Droppings were collected on clean papers in the nest boxes and from among wood shavings in the dropping trays. Of a total of 124 samples tested, we isolated *Ps. aeruginosa* from 36 samples, *P. mirabilis* from 24, and both from 17 samples. When we first began culturing the fecal samples, we did not always use the enriching tetrathionate broth, and we found that when this preliminary step was omitted there was a higher percentage of negative results (*i.e.*, no growth on the agar plates).

We have also isolated *Ps. aeruginosa* from pus present in eye infections. Numerous cases of eye infection occurred, but only three pus specimens were cultured and Pseudomonas was found in all three. Except for one case where *A. flavus* was found, the eye symptoms were the same, being characterized by a more or less rapid production of a thick, white pus which covered the cornea. Generous applications of sulfathiazole powder dusted directly into the eye, after cleaning it with a cotton swab, gave uniformly good results. None of the affected animals became blind or suffered any apparent impairment of vision, even after recurrent infection.

†Originally reported as Salmonella typhosa but later identified by the Communicable Disease Center, Chamblee, Ga., as Proteus mirabilis.

TABLE 3—Bacteriological Cultures of Chinchilla Specimens

No. of specimens examined	Specimens	Results		
		Ps.[1] and P.[2]	Ps.[1]	P.[2]
7	Stomach	5	—	1
5	Small intestine	1	—	4
1	Fur ball	—	—	1
3	Cecum	1	1	1
7	Liver	2	1	3
4	Heart	—	1	1
7	Lung	1	2	—
7	Kidney	1	—	2
1	Testis	—	1	—
1	Anal gland	—	—	1
2	Gall bladder	—	1	1
2	Spleen	1	—	1

[1]Ps. = Pseudomonas aeruginosa; [2]P. = Proteus mirabilis.

Sources of Bacterial Infection.—After having ascertained the probable cause of disease, our next concern was to establish the source. The two logical avenues of bacterial infection, contaminated water or food, were therefore investigated by means of several experiments.

The chinchillas had regularly been supplied with "city" water (purified for human consumption), but for a period of nine days in June they were given lake water. In August, the state laboratory found *Ps. aeruginosa* present in a sample of lake water taken from our laboratory faucet. No Salmonella or Proteus were found. We then tested samples from the chinchilla water bottles and all but one of 19 samples showed abundant Pseudomonas. The city water was also tested and was found to be free of all three pathogens.

Inasmuch as the lake water contained no Proteus and since the chinchillas were housed in close proximity to white rats, it was felt that these bacteria might be transmitted from the rats to the chinchillas by the inhalation of dust or by way of the food, with flies acting as vectors. In order to determine whether the rats were harboring the pathogen, we cultured 19 fecal samples of rats from various cages at various times, collecting them in the same manner as the chinchilla feces. From 16 of these we isolated *P. mirabilis.* Random samples of rat feces from nine different cages were cultured for Pseudomonas, but none showed any growth of this organism at the end of forty-eight hours of incubation. Staphylococcus and *Escherichia coli* were identified on an agar plate exposed to the air in the laboratory, but no Pseudomonas or Proteus were found.

Tests of Pathogenicity for Other Species.—In order to gain further information about the two pathogens, *Ps. aeruginosa* and *P. mirabilis,* a number of experiments were run on rats, mice, guinea pigs, and chickens. Chinchillas were not used because of their high cost. The experimental animals were housed individually in the chinchilla laboratory in small cages set close to the rat cages. Nutrient broth or water suspensions of pure cultures of these organisms were introduced into the drinking water, mixed with the ration, or injected into the animals. All injections were intraperitoneal and were measured as to volume but not as to bacterial count. Control animals and birds were injected with distilled water. The amount of pathogen fed varied with the quantity which

could be grown, and intake depended upon the appetite of the host.

Rats.—Injection of 0.5 ml. of a suspension of *Ps. aeruginosa* was lethal within eight hours for white adult rats. Rats injected with the same volume of a suspension of *P. mirabilis* survived, but others injected with 1.0 ml. of culture died within twenty hours. One rat injected with a mixture of 0.25 ml. of Pseudomonas culture plus 0.25 ml. of Proteus culture died within ten hours.

Mice.—Injection of 0.2 ml. of Proteus suspension was lethal within twenty hours for adult white mice. Feeding experiments gave results varying with the age of the host. Fifteen-day-old white mice (weight about 3 Gm.) fed Proteus died in two to five days. However, 17-day-old brown mice (weight 3-4 Gm.) which were fed Proteus were still alive after seventeen days on experiment, and adult brown mice (original weight 25-33 Gm.) were alive after forty-five days on experiment. Seventeen-day-old white mice (weight 3-4 Gm.) fed Pseudomonas were still alive after twenty-five days on experiment. The survivors were killed at the end of the experiment by injecting 0.5 ml. of culture of the respective organisms.

Guinea Pigs.—All guinea pigs used were young adults weighing between 412 and 573 Gm. at the start of the experiments.

After injection with 0.25 ml. of Pseudomonas culture, 1 guinea pig died within twenty-seven hours and another in three days. A third guinea pig, injected with a total of 1.5 ml. of Pseudomonas culture within twelve days, died the day after the third injection. The bacterial source differed in all 3 animals. At necropsy, the viscera of the 3 guinea pigs showed the same general gross pathology, characterized by inflammation and hemorrhage, as that exhibited by the chinchillas. The liver of the guinea pig which survived the longest was speckled. In 2 animals, *P. mirabilis* as well as *Ps. aeruginosa* was isolated from cultures of various organs: from nine organs in 1 and from six in the other. When Pseudomonas was fed to 1 guinea pig, it continued to grow but gained only 74 Gm. during three months of bacterial feeding.

One guinea pig, injected with a total of 7.0 ml. of *P. mirabilis* culture within six weeks, appeared exceedingly sick and sluggish during the experimental period but maintained its weight and, after injections were stopped, gained 138 Gm. in seven weeks. (Some strains of this organism, however, are reportedly pathogenic for the guinea pig.[7-9]) One guinea pig, which was fed the organism, was alive after three months of feeding and had gained 104 Gm., as compared with a gain of 144 Gm. by a control animal. It is to be noted that these experiments were performed seven or eight months after the disease had reached its peak in the chinchillas, so that experimental conditions were not similar due to the lapse of time and to decrease and turnover in the rat population of the laboratory.

It should also be mentioned that the guinea pig already referred to under the histology heading, exhibited gross internal lesions similar to those found in the chinchillas, and that bacterial cultures of various tissues were positive for both pathogens. *Pseudomonas aeruginosa* was found only in the cecum, but *P. mirabilis* was isolated from the cecum, stomach, spleen, and liver.

Chickens.—Age seemed to offer protection in the case of the experimental birds used. An injection of 0.2 ml. of Proteus suspension was lethal within twenty hours for a week-old chick (weight 35 Gm.). A total of 4.0 ml. of injections each, of

Fig. 3—Animal 62 died the day before this photograph was taken; the body was placed in the refrigerator immediately after death. The photograph shows the inflamed uterus (arrow) and the small intestine (left) which has the same appearance as that in figure 1.

Proteus suspension within a week, was not lethal for 2, 56-day-old chickens (weights 271 and 323 Gm.). Neither were similar amounts of Pseudomonas culture lethal for 1, 56-day-old chicken (weight 331 Gm.). Another 56-day-old chicken (weight 412 Gm.), injected with 2.0 ml. each of Pseudomonas and Proteus cultures during the same period, also survived. None of the birds injected exhibited much discomfort. The chickens that were injected were originally fed the respective organisms beginning at 10 days of age. One of 2 receiving Pseudomonas died within fourteen days, and 1 of 2 receiving the mixture died at the same time. Both chicks receiving Proteus survived. Following injection, bacterial feeding was stopped, at which time the survivors, all males, were put on a normal ration and were kept under observation until they were 4½ months old. None showed any abnormal symptoms and feathering was fairly good in all cases. Their weights at this time ranged from 1,294 to 1,560 Gm. Two control hens weighed 1,068 Gm. and 1,390 Gm.

SECONDARY PATHOGENS

We frequently encountered two molds during these studies: Trichophyton (species not identified) and *A. flavus*.

Trichophyton.—Sixteen chinchillas were infected at various times with an organism which caused the hair on the face, and occasionally on other parts of the body, to drop out. Microscopic examination of skin scrapings and of infected hair roots led us to suspect a fungous infection. Later, one of the authors contracted the infection, at which time the pathogen was identified at the Wisconsin State General Hospital. In the chinchillas, the infection (trichophytosis) usually appeared around the nose and lips and then spread backward to cheeks and chin. Various ointments were applied with little or no success. Spergon, a plant fungicide, made into a paste with water and applied locally was more effective but is toxic for the chinchilla. Medication with an antimycotic tentatively known as "X-263"* was the most effective remedy. With it, skin lesions healed completely in a comparatively short period in most cases. It is apparently nontoxic. This infection was more difficult to control and was most resistant to treatment during hot and humid weather. After the installation of a second temperature control unit, which enabled us to hold the laboratory temperature at 68 to 70 F., we had only 5 cases of trichophytosis.

*We are indebted to Wallace and Tiernan Products, Inc., Belleville, N. J., for supplies of "X-263."

Aspergillus Flavus.—Several times molds had grown abundantly on feces and organs cultured for bacterial growths. The cultures in which they were found were prepared as previously described. Sugar slants containing the growths were submitted to the botany department** where they were identified as *A. flavus*. The Aspergillus organisms were isolated from cultures of the small intestine of 1 animal, the liver of another, and the pus from an infected eye of a third. The latter animal lost its sight before the infection could be controlled. The character of the lesion was distinctly different from other eye infections already described. In this case, the cornea was covered with a hard, opaque crust which could not be dislodged. The infection did not respond to sulfathiazole powder or to penicillin ointment and after more than a month of treatment the lens dropped out of the orbit.

It is possible that Aspergillus was a contaminant since *Ps. aeruginosa* was also isolated from the eye culture. However, there are numerous records of sporadic infections in human beings by this organism,[10,11] and Wright[12] has reported two cases of granuloma of the eye caused by Aspergillus organisms which resembled the *flavus* species. No data as to the route of infection have been uncovered and the question as to whether Aspergillus is a primary or secondary invader remains unanswered.

Medication.—Upon the suggestion of the Department of Veterinary Science of the University and the state laboratory, a wide variety of antibiotics and sulfonamides were administered, especially during the epizoötic, but since all but 6 of the animals treated eventually died we can conclude nothing as to the efficacy of any of the drugs used. Some animals were probably too badly diseased before treatment was initiated to be able to respond. The natural defenses of the survivors may have been great enough to withstand the ravages of disease, but to what extent the drugs aided in this defense it is not possible to say. Dosages with a series of medications, all given within a short time of each other, make it impossible to evaluate the effectiveness of any one drug. There is likewise the possibility that the efficiency of some drugs was impaired by administering them in conjunction with others.

**Myron P. Backus of the botany department identified the growths.

Human infections caused by *Ps. aeruginosa* are said to have been treated effectively by using the polymyxins (aerosporin). This organism is also reported to be susceptible to streptomycin, dihydrostreptomycin, and the sulfonamides, but is resistant to penicillin.[13-17] On the other hand, some investigators feel that since *Ps. aeruginosa* is principally a "scavenger of necrotic material," the removal of such material is of more importance than the administration of antimicrobial drugs.[16] The Proteus group generally is resistant to aerosporin. *Proteus mirabilis* is also resistant to penicillin but is inhibited by streptomycin.[9]

For the record, dosages of 50 mg. of aureomycin per day, 25 mg. at twelve-hour intervals, were large enough to produce nausea in approximately half of the animals on the second day. Aerosporin is painful and should probably be injected along with procaine, as recommended by the distributor. It is also toxic and, in 1 animal, produced large sores which did not heal readily. In most other cases, more than 2 or 3 mg. of the drug produced a hard swelling in the muscle at the site of injection.

DISCUSSION OF RESULTS

The bacteriological and pathological findings confirm other reports regarding the pathogenicity of *Ps. aeruginosa* for the chinchilla.[1,18,19] The organism is definitely implicated by its luxuriant growth in a large number of bacterial cultures and by the absence, except for *P. mirabilis*, of other enteric bacteria. Furthermore, the lesions and symptoms are typical of those known to be caused by Pseudomonas, *i.e.*, bronchopneumonia, necrosis and ulceration of the intestine, hemorrhage, and inability to conceive.[2,3,9,20]

Originally, there was a question in our minds as to whether Pseudomonas was a primary invader. For example, rats housed in the chinchilla laboratory and animals in other laboratories in the Department, all of which were regularly supplied with lake water, did not show evidence of Pseudomonas infection. We ran a number of tests on feces of rats and guinea pigs picked at random from various laboratories, some of which were positive for *Ps. aeruginosa* as well as *P. mirabilis*. Thus, it appears that some mammalian species harbor these pathogens without ill effect. This may be due to immunity, natural or acquired, or possibly to the rations, assuming the latter produce a gastric pH unfavorable for the overgrowth of bacterial pathogens. Also, bacterial feeding did not kill species shown by intraperitoneal injection to be susceptible. It is possible that the pathogenic effects of bacterial feeding were nullified due to the attenuation of virulence of the organisms through one or more of the recognized paths, such as the culture mediums employed, the selection of nonvirulent colonies, or the use of resistant hosts.

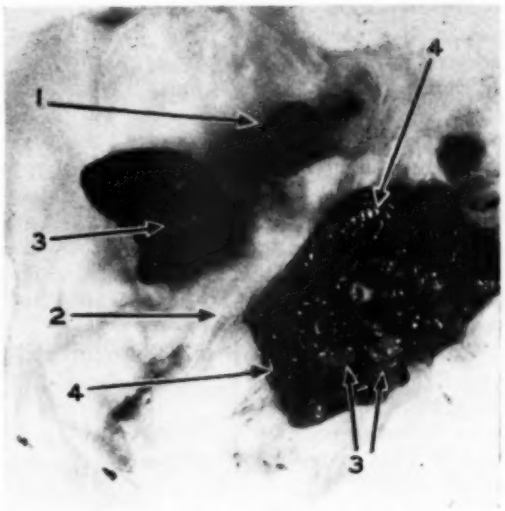

Fig. 4—The dissected stomach (2) and trichobezoars (1) of animal 62 are photographed against a background of cotton. The mucosa (4) is badly inflamed and covered with mucus (3), some of which may be seen clinging to the black fur balls.

The anatomy of the host may also play a part. On a weight basis, the chinchilla has the largest cecum of any of the experimental animals used and might on this account be more liable to bacterial attack. Traversal of the extensive intestine and cecum by those microörganisms which escaped destruction in the stomach would allow a comparatively long period for incubation and multiplication. Furthermore, Pseudomonas, while a relatively harmless saprophyte on open surfaces, is known to become highly pathogenic in closed cavities.[20] In this connection, one of the experimental rations being fed to the chinchillas, while nutritionally adequate, tended to produce constipation. Such a condition would naturally enhance the pathogenic potentialities of organisms present in the gut.

Another item of interest was that practically the same histological picture was present in 5 chinchillas dying before the epizoötic, which were supplied with city water, as in those dying afterward. As previously pointed out, however, the animals composing our herd came from many sections of the country and it is possible that they were exposed to infection while en route to our laboratory or that some were harboring latent enzoötic infections which did not become apparent until long after their arrival.

As previously pointed out, Pseudomonas and Proteus appeared in bacterial cultures to the virtual exclusion of other enteric organisms, Davis and McDermott[16] suggest that certain drugs, such as aureomycin and streptomycin, suppress the growth of normal coliform organisms and permit a consequent overgrowth of Pseudomonas and Proteus. It is not yet established whether the overgrowth of one or two species at the expense of other normal intestinal inhabitants enhances the pathogenicity of the surviving species, or whether the latter are able to colonize at a rate which insures infection of one sort or another. At any rate, breeders should be cautioned against the indiscriminate use of antibiotics.

Pseudomonas aeruginosa, itself, produces at least nine different antibiotics which are active principally against gram-positive bacteria.[13] Pyocyanase, a lipoidal, enzyme-like substance produced by Pseudomonas, is also active against some gram-negative bacteria, including *Bacterium coli*, but is ineffectual against *Bacterium proteus*.[21] Bacteriolytic and hemolytic properties of alcohol and acetone extracts of Pseudomonas are reported to be due to fatty acids.[22] The fatty changes of the liver seen in histological sections might possibly be accounted for on this basis.

In contrast to *Ps. aeruginosa* which is found in water and soil, the distribution of *P. mirabilis* is not known, although its relationship to animal infections has been stressed in recent years by one worker in the field.[9]

Since there are no reports in the literature regarding the intestinal flora of healthy chinchillas and all our work has been with diseased animals, it is not possible to say whether these organisms are normally present in the intestinal tract. We can state, however, that both organisms are very resistant to destruction. Deaths were still occurring among the remaining chinchillas after twenty-two months of observation. In a recent necropsy, typical lesions were observed and both organisms were isolated from organ cultures as well as from the animal's drinking water.

Ever since we established that the chinchillas were infected with Pseudomonas, we have autoclaved the drinking bottles weekly and they have, of course, always been filled with city water except for the short period in the early summer already mentioned. In spite of these precautions, we have found Pseudomonas present in a number of samples taken from various bottles, showing that already infected animals can contaminate their water which then becomes a source of reinfection. Other investigators also have found that originally sterile bottles filled with sterile water gave positive tests for Salmonella when the bottles were used by Salmonella-infected mice.[23] Drinking water taken directly from the bottles may thus serve in diagnostic tests instead of fecal material, especially where the latter method gives negative results in suspected cases.

SUMMARY

Our studies on the nutritional requirements of chinchillas were interrupted by disease among the animals. Most of the herd succumbed to an enteritis, with septicemic complications, which we believe to be of bacterial origin. Bacteriological studies enabled us to isolate two organisms, *Pseudomonas aeruginosa* and *Proteus mirabilis*, which consistently grew in great numbers in chinchilla specimen cultures to the practical exclusion of other enteric organisms. Both bacteria are recognized pathogens. There are also a number of reports in the literature concerning the pathogenicity of *Ps. aeruginosa* for the chinchilla.

Pathogenicity studies made on other animals and birds gave variable results, depending upon species and age of the host and the method of introduction of the pathogen to the host. Injections of small amounts of Pseudomonas cultures were lethal for adult rats, mice, and guinea pigs but comparatively large injections were not lethal for 56-day-old chickens. Relatively small injections of Proteus were lethal for adult rats and mice and for a week-old chick, but comparatively large quantities

did not kill older chickens nor an adult guinea pig. When fed, Proteus was lethal for 15-day-old mice, but neither Proteus nor Pseudomonas was lethal for older mice, guinea pigs, and chickens. However, Pseudomonas appeared to be harmful when fed to young chicks.

We have encountered two molds in our work. Trichophyton causes a skin infection which is difficult to control in hot, humid weather. The role of *Aspergillus flavus*, in relation to the chinchilla is not clear, but the frequency with which it has grown on bacteriological cultures leads us to regard it with suspicion.

From nutritional observations reported elsewhere, the chinchilla appears to be adaptable for use as a laboratory animal. However, the epizoötiological problems which confronted us indicate that this species demands a much greater measure of care, sanitation, and isolation than is customary with most other commonly used laboratory animals.

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Teat Cup Liners Hold Bacteria

Deterioration of rubber teat cup liners is often responsible for high bacterial counts in milk, and perhaps mastitis also. Some liners, apparently in good condition, showed intense cracking and surface breakdown when examined under the microscope, whereas new liners were usually smooth. The bacterial count of water used to rinse old teat cups ranged from three to 92 times as great as for new liners, but there was little difference between smooth-looking old liners and those which appeared rough. Checking was most obvious when liners were stored in chlorine solution. This breakdown usually was evident in liners used for three months but it varied in direct ratio to the number of cows milked. Rubber liners should be changed at the first visible sign of checking.—*Hoard's Dairyman, Feb. 10, 1954.*

Infectious hepatitis occurs in dogs just as frequently as distemper and many are mild cases which do not terminate fatally. —*C. J. York, D.V.M., Indiana.*

Coccidioidomycosis of Cattle in the Southwestern United States

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COCCIDIOIDOMYCOSIS is a disease of cattle caused by the fungus, *Coccidioides immitis*, which causes a mild granulomatous infection of the respiratory system; it is enzootic in certain areas of the southwestern United States. Seldom seen in the past, its incidence has increased until now it is the infectious disease most frequently seen on postmortem examination of cattle slaughtered in California. Fortunately, it has little if any effect on the live animal, and the loss on postmortem examination is usually confined to condemnation of the lungs by veterinary meat inspectors. However, the disease is important from the standpoint of correct differential diagnosis in order to distinguish it from tuberculosis, actinobacillosis, actinomycosis, pyobacillosis, and pentastomiasis. It also has some public health significance.

This report is based upon the observation of 3,173 cases by the author.

HISTORY

Wernicke and Posades, in 1892 in Argentina, first isolated the organism from a human case. In 1894, Rixford reported the first human case in California. In 1900, Ophüls[21] and Moffitt in California cultured the organism from a human case and found it to be a fungus. Only the chronic form of the disease (coccidioidal granuloma) was recognized until 1936. Then Gifford and, in 1937, Dickson[13] described "valley fever," an influenza-like disease which had long been prevalent in man in the San Joaquin Valley of California, as a benign infection due to *C. immitis*. This benign form was studied by Smith[28] and he concluded that most people in the endemic area acquire the infection but some show no symptoms. Some cases resemble influenza, but a small percentage develop erythema nodosum. A few people develop the chronic, generalized form of the disease, which is often fatal.

In 1918, Giltner[16] first found *C. immitis* in bovine lesions at San Diego. He experimentally transmitted the infection to guinea pigs, rabbits, a dog, cattle, sheep, and swine.

ETIOLOGY

The disease, which is caused by the fungus *C. immitis*, is found in the granulation tissue and the purulent material of the lesions. The fungus appears as spherical bodies, varying in diameter from about 5 to 50 μ. The protoplasm is finely granular and the wall is highly refractile and double-contoured.

EPIZOOTIOLOGY

Geographic Distribution (*Table 2*).—Human infection is endemic in the San Joaquin Valley, in certain areas in the adjoining coastal region, and parts of southern California. The disease is also endemic in southern New Mexico and Arizona and in southwestern Texas. This study indicates that the disease is enzoötic in cattle in approximately the same areas except for the few cases which apparently acquired their infections in northern California, southern Oregon, and southeastern Colorado.

Endemic areas of human infection outside the United States are northern Mexico, Venezuela, Paraguay, and northern Argentina. Infection in animals has not been reported outside this country except for 4 cases in cattle from Mexico, reported by Stiles and Davis.[31]

Transmission.—The spores are found in the respiratory exudate and drip out or are carried out in expired air. Direct transmission of the disease from animal to animal, including man, does not seem to occur. Chlamydospores are formed in the soil and are blown around with dust. The man or animal which inhales infective chlamydospores may become infected.

Susceptible Hosts.—Man.—In endemic areas, infection in human beings is almost universal. Man often acquires the infection as a child if he lives in such an area. People of any age may acquire the infection when they move into such an area. The acute form of the disease almost assumed epidemic proportions when people migrated into the San Joaquin Valley from the drouth areas of Oklahoma and Texas in the mid 1930's. Another upsurge was seen during World War II in new personnel as they moved into military installations in these endemic areas.[15,27] The situation was repeated during the Korean war. Some people

This investigation was conducted while the author was a veterinary meat inspector for the U. S. Bureau of Animal Industry in Los Angeles and San Francisco, Calif. At the present time, he is studying for a Master of Public Health degree at the University of California at Berkeley.

who merely travel through the endemic areas of the Southwest acquire the infection.

Sheep.—Beck[1] reported the finding of one gross lesion in a sheep, as did the author (*see* p. 465). Phillips,[22] in a report on the presence of coccidioidal infection in the Salt River Valley around Phoenix, Ariz., found that 10 per cent of the people tested were positive to the coccidioidin test. Many of these people were from rural areas where more had handled sheep than cattle. Perhaps many sheep acquire the disease without any lesions developing.

Dogs.—The disease is not rare in dogs in endemic areas. Farness,[14] Plummer,[23] Watson,[32] Spriegel and Milliff,[29] Smith,[28] Jasper and Lewis,[17] and Cordy and Hoop,[6] have reported cases.

Chinchilla.—Jasper,[16] reported one case in a chinchilla.

Rodents.—Emmons[13] reported finding infected desert rodents (pocket mice, kangaroo rat, and ground squirrel) in Arizona.

Gorilla and Monkey.—McKenney *et al.*[20] reported finding, on postmortem, an infected mountain gorilla and a tropical American monkey.

Cattle.—Occasional infections in cattle have previously been reported by Giltner,[15] Davis and Stiles,[9] Davis, Stiles, and McGregor[10] Stiles, Shahan, and Davis,[30] Beck, Traum, and Harrington,[2] and Beck.[1] These are summarized in a report by Stiles and Davis[31] who stated that, by 1942, 62 definite laboratory diagnoses had been made. Some of the diagnoses were representative samples taken from sizable lots of infected cattle and the number of animals with gross lesions which were not submitted may have been five to ten times greater. In 1948, Prchal[24] reported a general infection in the Phoenix area. Cattle from feedlots in enzoötic areas now often acquire the infection, whereas twenty years ago the disease was seldom seen.

The author, as a veterinary meat inspector in 1947-1951 at various Los Angeles slaughterhouses, personally inspected 2,262 cases (table 1). The infection was found in 1.8 per cent of all cattle inspected (calves excluded); in 2.9 per cent of all beef steers and heifers; and in 7.3 per cent of the steers and heifers from San Joaquin Valley feedlots. Due to the fact that various slaughterhouses acquire their cattle from different areas and that different houses kill different types of cattle, it was realized that a disproportionate period of time spent at an establishment with a high or low rate of infected cattle would give inaccurate statistics. The incidence was then figured for each establishment and the over-all infection rate was again determined. The figures were at the most only 0.3 per cent different from the previous figures (table 1).

In San Francisco, from June to September, 1953, the author, on postmorten examination, found 911 infected cattle (table 1). Of all cattle (calves excluded) inspected, the over-all infection was 9.07 per cent; in beef steers and heifers, 9.99 per cent. Of the steers and heifers from the San Joaquin Valley feedlots, 13.3 per cent were infected. Again, when adjusted to an establishment basis, the true average incidence of infection for all classes of cattle (calves excluded) slaughtered in the area was 6.27 per cent; of the beef steers and heifers, 7.2 per cent. This three-month survey would be about average for the year. The highest incidence of infection was found in cattle slaughtered during September through December; the lowest incidence, during February through April. Cattle fed in the dusty, windy season showed the most infection; those fed when lots were muddy showed the least.

Factors Influencing Susceptibility.—Almost all infected cattle were steers in good condition which, just prior to slaughter, had been in feedlots in an enzoötic area for thirty days or more. The infection rate in different breeds and sexes was proportionate to their numbers. Also, while most of the cattle from feedlots were in good condition, a proportionate number of the few which were in only fair or poor condition

TABLE 1—Numbers of Cattle and Calves, Slaughtered in California, with Gross Lesions of Coccidioidomycosis Observed by the Author

		Calves all breeds		Cattle			
				Dairy		Beef	
Station	Numbers	Under 2 mo. old	Over 2 mo. old	Steers and heifers	Cows and bulls	Steers and heifers	Cows and bulls
Los Angeles Dec., 1947- May, 1951	Inspected	61,246	10,767	384	32,131	76,835	10,626
	Infected	0	17	7	4	2,228	6
	Infected (%)*	0.0	0.156	1.8	0.012	2.9	0.056
	Adjusted† infection (%)	0.0	0.171	1.5	0.09	2.8	0.070
San Francisco June 1, 1953- Sept. 1, 1953	Inspected	13	436	31	521	9,145	348
	Infected	0	2	1	0	908	0
	Infected (%)*	0.0	0.46	3.2	0.0	9.99	0.0
	Adjusted† infection (%)	0.0	0.83	2.7	0.0	7.20	0.0

*This is the actual infection percentage of the animals inspected and reported in this study.

†This is the actual infection percentage for each class of animals slaughtered at each station. Infection percentage for each slaughterhouse was determined—from this, the station average was determined. This was to allow for the disproportionate period of time spent at a house with a high or low rate of infection.

were infected. Most cattle from the feedlots were 16 to 42 months of age; however, a small number of old cows, bulls, and calves that were fed in these feedlots were proportionately infected. Therefore, age, like breed, sex, and condition, does not seem to be a major factor affecting susceptibility. Some infected cattle have come in from pasture lands; however, in most cases where it was possible to check, it was reported that the cattle had been receiving supplemental grain and hay, which created a dusty area around the feeding and watering area. Therefore, apparently the one important factor in the incidence of this disease is the presence of cattle in a dusty area where the disease is enzoötic. Prchal[24,25] points out that in the Phoenix area almost all affected cattle come from feeding operations in dusty pens and that animals directly from the range or desert rarely are infected. He also observed that dairy cows introduced into an average dairy herd in Arizona could become infected and show gross granuloma lesions in three and one-half months.

Stewart and Meyer,[32] Davis *et al.*,[8] and Emmons[13] have isolated *C. immitis* from the soil. Dickson[12] observed that many people acquire the acute form of the disease in endemic areas, but only a few develop coccidioidal granuloma, the chronic form of the disease. It is possible that many cattle may likewise acquire the infection, with only a small percentage developing coccidioidal granuloma.

Lesions are rare in cattle used for dairy purposes although they are sometimes kept in dry, dusty lots. They may become infected, then the lesions may become organized and disappear. However, since about 15 per cent of the lesions of cattle show some degree of calcification, numerous calcified areas should be found in bronchial and mediastinal lymph nodes of old cattle, but this is not the case. It is possible that dairy calves on pastures in enzoötic areas may acquire a slight infection when quite young, without developing lesions, and thus may become immune. On the other hand, beef calves often are raised outside of the enzoötic areas, then when about 2 years old they enter heavily contaminated feedlots and, in about twenty days, gross visible lesions have developed.

Most of the cattle covered by this report were traced to their feedlots by information obtained from the meat-packing establishments and to their ranch of origin by brand identifications. However, some may have, for a time, been in other areas. There is also a remote possibility that some may have been infected by dust from feed shipped to them from enzoötic areas. Animals fed only on grass seldom have the disease. In one lot of 43 cattle from Utah, 18 slaughtered immediately because they were fat were all negative, while 7 of 25 put into a California feedlot were positive when slaughtered sixty-four days later. Of 163 from Idaho, 32 slaughtered immediately were negative, while 17 of the 131 had granuloma lesions after fifty-seven days in a California feedlot (table 2).

The number of cases seen on postmortem is gradually increasing. Feedlot steers from enzoötic areas of the San Joaquin Valley showed 5.2 per cent infection in 1948, 8.1 per cent infection in 1951, and 13.3 per cent infection in 1953. Since 1953 was a dry year, the incidence may drop.

Statistics indicate that whereas cattle-feeding for the state, since 1947, has doubled, the number fed in the San Joaquin Valley has tripled.[4] This no doubt accounts for some of the increase in cases of the disease.

Smith[26] points out that the incidence of the acute form of the disease in man in the San Joaquin Valley is, as in cattle, highest in the dusty, early fall. Symptoms of the acute form of the disease in man are seen about two weeks after infection.

TABLE 2—Probable State of Origin of Coccidioidomycosis in 3,173 Cattle and Calves Observed in This Study

Probable origin of infection	Number of cases	Comments
California	2,741	About half came to feedlots from California range, half from 10 other western states.
Arizona	211	Direct from Phoenix and Tucson area feedlots.
New Mexico	36	Direct from eastern New Mexico feedlots.
Texas	23	Direct from western Texas feedlots.
Colorado	17	Direct from southeastern Colorado feedlots.
Oregon	4	Direct from southern Oregon feedlots.
Origin not definite	141	All fed in 2 of the first 4 states listed (most fed in Phoenix area first, in Los Angeles area last).
Total	3,173	

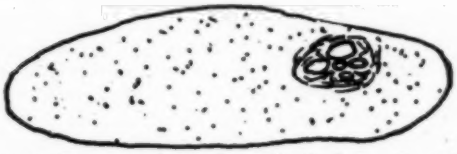

Fig. 1—Cross section of mediastinal lymph node, showing a typical slight caseous coccidioidomycosis lesion. (Black and white photographs of this type of lesion distinguish very poorly between the gray of the lymph node and the pale yellow of the granuloma pus.)

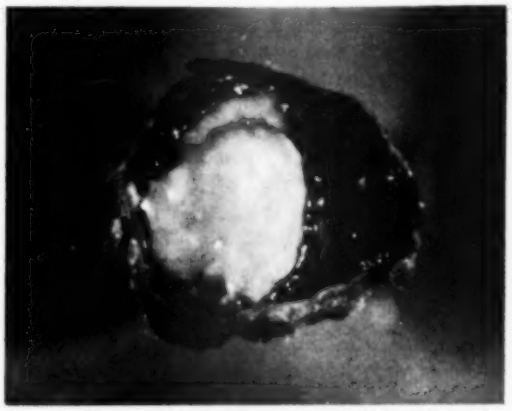

Fig. 2—Cross section of a bronchial lymph node showing an extensive caseo-calcareous lesion. (The lymph node tissue was shaded to make the lesion more visible on a black and white photograph.)

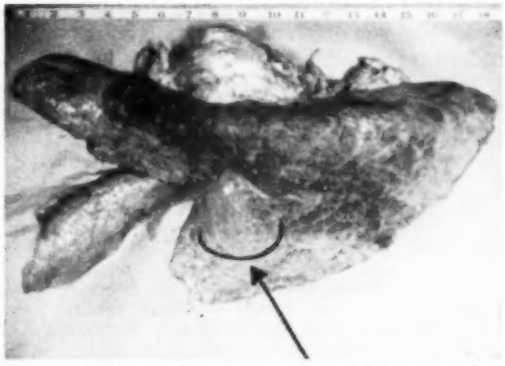

Fig. 3—Left lung of steer, showing solid area 2 inches in diameter, containing a granuloma.

Fig. 4—Same lung shown in figure 3, showing granuloma opened.

SYMPTOMATOLOGY

The acute form of the infection, if it occurs, has not been observed in cattle. (In man, it is an influenza-like disease.) The chronic form of the disease shows no symptoms.

PATHOLOGY

Pathogenesis.—The chlamydospores are inhaled and deposited in the respiratory tract. Local lesions may develop around a bronchus, a bronchiole, or an alveolus, with or without lesions in the pulmonary lymph nodes. Often, no gross lesions are seen in the lungs. The granulomas develop in the bronchial and mediastinal lymph nodes and rarely in the submaxillary or retropharyngeal lymph nodes. In 3 carcasses, a single lesion was observed in the epicardiac fat. Kellogg[19] reports one slight liver lesion in a large calf. A single lesion was found in a mesenteric lymph node in a steer.* It was confirmed by the pathology laboratory of the Denver, Colo., Bureau of Animal Industry. Perhaps infection via the digestive tract is possible.

Gross Pathology.—The lesions (fig. 1-4) were distributed as indicated in table 3 and typed as indicated in table 4. Of particular interest are the lesions with some degree of calcification which confuses the differential diagnosis from tuberculosis.

Lymph node lesions vary in size from those barely visible up to 4 inches in diameter. The smallest visible are a solid gray-yellow, similar in color to lymph node tissue, and difficult to see without good light. As they get larger, they become pale yellow with a granulation tissue wall and a necrotic focus and yellow pus in the center. By the time the lesion gets 1/3 inch in diameter, there may be several necrotic foci inside a single granuloma. The pus in these necrotic foci may be caseous, caseo-calcareous, or calcified. There may be one or several granulomas in a lymph node. When

*This lesion was found after the study of the 3,173 cases was completed and for this reason is not shown in table 3.

lesions are well marked or extensive in the bronchial or mediastinal lymph nodes, careful search usually reveals lung lesions. Prchal[25] confirms this observation.

Lung lesions may be located anywhere; however, most are in the anterior lobes near the dorsal surface of the large bronchi. Their average size is ¾ to 1 inch in diameter, and they often fill one or several lung lobules. Developing lesions first have a pink color when fresh, then red hepatization is seen, next they become a pale yellow, then gray, and the oldest lesions are white. There may be one or several necrotic foci containing pale yellow pus in these granulomas. Rarely, there may be miliary type lesions about 1/16 of an inch in diameter concentrated in an area about 1 inch in diameter, with normal lung tissue in between the little granulomas. Lung granulomas are sometimes present without lymph node involvement.

Microscopic Pathology (Fig. 5).—Dr. C. L. Davis'** descriptions of the various types of lesions follow:

> Sections of lymph nodes may show an encapsulated granulomatous process with a central mass of caseous debris. There is a considerable epithelioid reaction, and giant cell formation is prominent. Within the necrotic zone, occasional accumulations of polymorphonuclear leukocytes are found and the double-walled spherical form of *C. immitis* can be identified.
>
> In some sections, the central mass may be caseo-calcareous or completely calcified. Spherules can be found in both the cellular and necrotic zones. Some spherules are seen being phagocytized by giant cells. Sometimes spherules are surrounded by a distinct row of hyalin clubs.
>
> Some sections, instead of showing one sizable necrotic area, show many small areas.
>
> Sections of lung granulomas show essentially the same type of lesion. In addition, there is often a considerable infiltration of inflammatory cells of the chronic type.

**Dr C. L. Davis and his staff at the pathology laboratory of the U.S.D.A. Bureau of Animal Industry (now Agricultural Research Service) in Denver, Colo., did the confirmatory laboratory work for this investigation.

DIFFERENTIAL DIAGNOSIS

Gross Examination.—As the disease becomes more prevalent, correct differential diagnosis becomes more important.

Tuberculosis. — Differentiating between coccidioidal granuloma and tuberculosis in human cases is difficult. In cattle, there is enough difference in the typical gross lesions to make a correct diagnosis possible about 50 per cent of the time. Tuberculosis lesions are usually a much brighter yellow, usually have no thick granulomatous wall, and the pus is usually caseo-calcareous. When the history is considered, differential diagnoses should be at least 95 per cent correct.

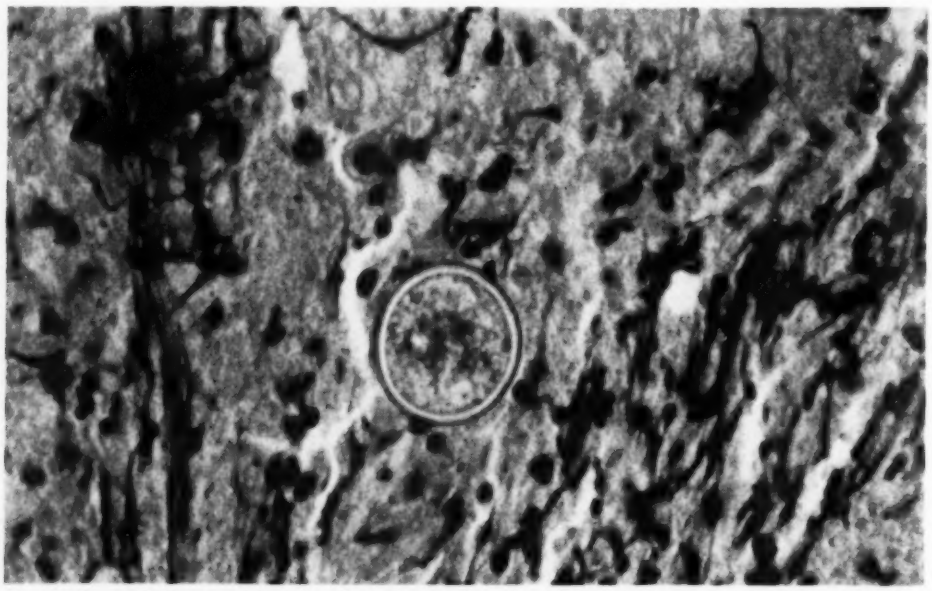

Fig. 5—Coccidioides immitis spherule in bovine bronchial lymph node tissue at edge of caseous lesion. x 635.

Coccidioidal granuloma is almost always found in fat, young feedlot steers and heifers while tuberculosis is confined largely to old dairy cows which almost never have coccidioidal granuloma. Even if a few of the lesions do resemble tuberculosis, typical granuloma lesions usually will be present in the lot. The author has not observed a mixed infection. Christman[5] reported a case in which tuberculosis was suspected on necropsy of heifers from a herd in which tuberculosis recently had been eliminated. However, the herd was negative when retested with tuberculin, and the lesions were found to be due to coccidioidal granuloma.

Actinobacillosis.—Actinobacillosis is almost always confined to the submaxillary and retropharyngeal lymph nodes, particularly in the western states, while coccidioidal granuloma is almost always found in the bronchial and mediastinal nodes. The actinobacillosis lesion usually has a rosette appearance and the color varies from a paler yellow to a brighter yellow than the typical granuloma. Actinobacillosis pus is usually solid, while granuloma pus is often caseous. Actinobacillosis, being the second most common bovine infectious disease of this type in California, is often seen in animals with granuloma lesions.

Actinomycosis.—This infection is almost always confined to the bony structures of the head. When a rare lesion of actinomycosis occurs in a lymph node, it usually has the appearance of actinobacillosis. Actinomycosis is the third most common disease of this type in California. It, also, is sometimes present in animals with granuloma.

Pyobacillosis.—Infection with *Corynebacterium pyogenes* occasionally causes purulent conditions in cattle, such as purulent pneumonia, in which case abscesses may be found in the bronchial and mediastinal lymph nodes. The pus is almost liquid and is foul smelling and the abscess wall is comparatively thin. Granuloma pus is usually caseated and has no odor.

Pentastomiasis.—*Pentastoma denticulatum* is the larval form of *Linguatula serrata*, a nasal arachnid of dogs, foxes, wolves and, rarely, of man. The disintegrating larvae are sometimes seen in the mesenteric lymph nodes of cattle and sometimes lesions are seen in the lungs and the bronchial and mediastinal lymph nodes. Disintegrating Pentastoma lesions have a greenish color due to the heavy infiltration of eosinophils. Granulomas of cattle are never greenish.

TABLE 3—Location of Coccidioidomycosis Lesions in 3,173 Cattle

Tissues infected	Infection (%)
Bronchial lymph nodes only	42.5
Mediastinal lymph nodes only	40.2
Bronchial and mediastinal lymph nodes only	8.6
Bronchial and mediastinal lymph nodes and lung only	5.4
Mediastinal lymph nodes and lung only	1.2
Bronchial lymph nodes and lung only	0.9
Lung only	0.7
Submaxillary and/or retropharyngeal lymph nodes with bronchial and/or mediastinal lymph nodes	0.5
Submaxillary and/or retropharyngeal lymph nodes with bronchial and/or mediastinal lymph nodes with lung	0.2
Submaxillary and/or retropharyngeal lymph nodes only	0.2
Pleural cavity only	0.09

Diagnosis by careful gross examination is usually possible; however, as Davis and Anderson[11] point out, the appearance of gross lesions can be misleading. In case of doubt, laboratory examination is advisable.

Microscopic Examination.—A simple smear of pus from a granuloma lesion on a microscopic slide under a cover slip should be examined first under low, then under high, power. Spherules, which look almost like the coccidia which cause intestinal infections of animals, are usually found in abundance. (Culturing the organism and the production of infection in experimental animals proves the diagnosis, but this is a risky procedure to persons in or near the laboratory because chlamydospores blow around and may produce acute primary coccidioidomycosis in nonimmune individuals.)

All the lesions found in cattle from outside the San Joaquin Valley, all those in animals other than steers and heifers, and all found outside the chest cavity were confirmed by microscopic smears; as were many of the more routine cases. Lesions

TABLE 4—Types of Coccidioidomycosis Lesions Observed in This Study of 3,173 cases

Type*	Percentage of time present
Slight caseous	56.3
Well-marked caseous	20.8
Extensive caseous	7.5
Slight caseo-calcareous	8.4
Well-marked caseo-calcareous	4.2
Extensive caseo-calcareous	3.1
Slight calcified	0.2

*Types—slight lesion, lymph node or organ not enlarged, more healthy than diseased tissue; well-marked lesion, lymph node or organ may or may not be enlarged, more diseased than healthy tissue; extensive lesion, lymph node or organ greatly enlarged, almost all tissue involved.

from a total of 823 animals were examined by the author by this method. Demonstration of the spherule was usually easy (809 positive findings) if the pus was abundant; but in caseo-calcareous lesions, and in new, small lesions, it was sometimes difficult to transfer tissue to a slide without tearing apart the spherules. Lesions from 166 cattle (other than the 823) were sent to the BAI pathological laboratory in Denver. Five were unsuitable for examination, but of the 161 all but one were diagnosed as coccidioidal granuloma, and that one, in a submaxillary node, was actinobacillosis. The laboratory found positive lesions as follows: in the lymph nodes—bronchial 81, mediastinal 51, retropharyngeal 2, submaxillary 2; in the lungs, 23; and pleural cavity, 1.

Infection in live animals can be determined by the use of coccidioidin which can be used like tuberculin. Beck, Traum, and Harrington[2] reported on its use in animals.

PROGNOSIS, TREATMENT, AND PREVENTION

Once the lesions are established, they probably remain. In rare instances, the lungs may become extensively involved. In general, the disease does not seem to impair the health of cattle. (Coccidioidal granuloma, the chronic form of coccidioidomycosis, in man is often fatal. Cox and Smith[7] report on 4 arrested pulmonary cases in man.)

There is no effective treatment. Fortunately, cattle need none.

Smith *et al.*[27] reported that infection rates in man could be cut 50 to 66 per cent in nonimmune, susceptible individuals by effective dust control. The same should apply to cattle.

MEAT INSPECTION AND PUBLIC HEALTH SIGNIFICANCE

Direct animal-to-man infection is not believed to be possible either by contact or by eating meat from an infected animal. When lesions are found in bronchial or mediastinal lymph nodes, or are not extensive in the lungs, only the lungs are condemned. If lesions found in lymph nodes of the head are slight, the head is passed after

Fig. 6—Map of areas from which cattle reported in this study appeared to have acquired their infections. Most infections originated in the shaded area. The balance of the infections originated from encircled areas.

the lesions are trimmed, but if the lesions are more marked the head is condemned. If lungs are extensively involved, the entire carcass is condemned, but U.S.D.A. records show only 11 such condemnations under BAI inspection, all since 1940. Likewise, the State of California meat inspection records[3] show 11 such condemnations, all since 1940.

It is of interest that animals may live on pastures in enzoötic areas for years and not show gross lesions. It seems usually to be only when those animals go into dusty pens or are confined in feeding areas that the lesions develop. Cattle probably become infected from dust, then the respiratory exudate of the infected animals keeps the ground well seeded. Cattle from some newly established feedlots show low rates of infection, but the incidence seems to increase with the number of cattle present. Some cattle from contaminated feedlots are sent to other western states and a few to midwestern states for further feeding. These feedlots could possibly become temporarily infective. (Emmons[13] has suggested that in desert areas infected rodents may be responsible for some of the fungus found in the soil.) It is barely possible that livestock handlers outside of the endemic areas could acquire coccidioidomycosis indirectly from infected cattle.

COMMENT

It would be of interest if some cattle in endemic areas were tested with coccidioidin on the range, on entering the feedlot, every fifteen days in the feedlot, and on leaving the feedlot for the slaughterhouse where they could be checked for visible postmortem lesions. It is possible that most of these feedlot cattle become infected but do not show lesions. Range and dairy cattle in endemic areas might also be tested to see if they are positive to coccidioidin.

Coccidioidin tests might be made on cattle handlers both in and outside of endemic areas to see if they might have a higher reaction rate than other workers of the same area.

SUMMARY

Bovine coccidioidomycosis, caused by the fungus *Coccidioides immitis*, is described. and 3,173 cases are reported. It is prevalent in certain areas of California, but apparently does not cause morbidity or mortality. Dusty feedlots seem to be the most common source of infection.

Cattle seem, usually, to acquire their infections in areas where human infection exists. A few cases reported here from other than known endemic areas could have acquired their infections either from feed contaminated in an endemic area, or an unreported part of their lives may have been spent in an endemic area.

Lesions, for the first time, are reported in the pleural cavity, and in the submaxillary, retropharyngeal, and mesenteric lymph nodes. Some degree of calcification is shown by 15 per cent of the lesions. Differential diagnosis of the disease is described. The meat inspection and public health significance of the disease is mentioned. Both man and animals seem to acquire infection from the fungus in dust; they do not appear to be directly infective to each other.

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Fungi and Disease

Infection or invasion of the tissues by fungi is apparently on the increase. Fungi were first incriminated in a disease of silkworms in 1835, then in favus and in thrush in man in 1839. Then, due to the influence of Pasteur and colleagues, attention turned to the bacteriological field and later to protozoa and viruses. Interest in fungi has revived, due to failures to account otherwise for certain pathological processes in the lung and because of the search for new antibiotics. Pathogenic fungi can be divided into two groups: (1) those normally associated with animals, and (2) saprophytes which become pathogenic under favorable conditions. The former may give rise to superficial lesions but seldom seriously injure the host. The latter cause most of the systemic mycoses such as aspergillosis (avian) and sporotrichosis.—*Brit. Vet. J., Feb., 1954.*

Erysipelas and Erysipeloid in Man

Erysipelas, caused by *Streptococcus hemolyticus*—usually group A—also known as "St. Anthony's fire," was a serious disease in the nineteenth century, often occurring in epidemic proportions in hospitals. It was especially prevalent in this country from 1841 to 1860. It occurred as a cellulitis with a temperature of 104 to 105 F. which, in untreated persons, continued for four or five days, producing a reddish, purplish skin. In some cases, bacteremia with a high mortality, pneumonia, and other complications occurred. Now rare, it responds well to sulfonamides or penicillin therapy.

Erysipeloid on the other hand is caused by *Erysipelothrix rhusiopathiae* and usually affects the hands of persons handling animals or fish. Lesions are purple instead of red and are rarely accompanied by fever. It also responds well to penicillin therapy. —*Medical Times, March, 1954.*

Carbomycin for Viral Infections

The antibiotic, carbomycin, demonstrated therapeutic activities against several viral and rickettsial infections. It would protect all mice when given within twenty-four hours after a mild infection with the psittacosis virus and was markedly beneficial as late as ninety-six hours after infection. It was also beneficial in cases of feline pneumonitis, bovine encephalomyelitis, and such rickettsial diseases as scrub typhus and Rocky Mountain spotted fever in guinea pigs.—*Vet. Bull., Feb., 1954.*

Rumen fermentation withstood the increased salt concentration of a high salt ration. The rumen microbial activity was not decreased nor was digestion altered.—*Vet. Bull., March, 1954.*

Bacitracin Treatment of Erysipelas

In Italy, when 47 animals with acute swine erysipelas were given 5,000 to 15,000 units of bacitracin in erysipelas antiserum, 40 recovered but 2 died. Of the remaining 5, 1 animal responded to a second injection of bacitracin and 4 to penicillin.— *Vet. Bull., Jan., 1954.*

Cultivating Protozoa from the Rumen

Two species of rumen protozoa, which usually remained alive twelve to fourteen days in a certain medium, disappeared in one to four days when streptomycin was added. However, when the bacteria developed a resistance to streptomycin the protozoa continued alive. Apparently, the protozoa were not affected by the streptomycin but were dependent on the bacteria for their metabolic processes.—*Vet. Bull., Jan., 1954.*

Coccidioidomycosis in a Sheep

KEITH T. MADDY, D.V.M.

Berkeley, California

In 1929, Beck[1] found the spherules of *Coccidioides immitis* in a pulmonary lymph node lesion of a sheep slaughtered at a Bakersfield, Calif., packinghouse.

In August, 1953, on a postmortem examination at a San Francisco, Calif., packinghouse, the author found a second case in a 1-year-old ewe from the lower San Joaquin Valley. She was in good condition but had lesions which resembled caseous lymphadenitis. Both the bronchial and mediastinal lymph nodes were slightly enlarged and quite solid due to their caseo-calcareous content. However, instead of one solid lesion with concentric lamellation, typical of caseous lymphadenitis lesions due to *Corynebacterium pseudotuberculosis* infection, there were, on the cut surface of each, five small nonlamellated lesions. The lesions varied from about 5 to 25 mm. in diameter and were a solid yellow-green in color. The tissue around and between the foci was white and solid.

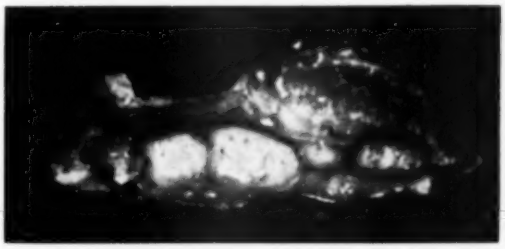

Fig. 1—Mediastinal lymph node (3 in. long) showing coccidioidomycosis lesions.

The lymph nodes (fig. 1 and 2) were sent to the U.S.D.A. pathological laboratory in Denver, which submitted the following report:

> Histological examination of the decalcified thoracic lymph nodes showed several encapsulated caseo-calcareous foci in which were seen spherical forms with a double refractile capsule morphologically indistinguishable from the spherules of *Coccidioides immitis*. While the majority of the spherules showed loss of protoplasmic substance, appearing as shadow forms, several still contained spores. The cellular reaction, such as giant cells, epithelioid cells, and other inflammatory cells was minimal in this sheep case.

Fig. 2—Spherule of Coccidioides immitis in lymph node tissue at edge of necrotic zone lesion. x 635.

This investigation was conducted while the author was a veterinary meat inspector for the U. S. Bureau of Animal Industry at Los Angeles and San Francisco, Calif.

[1]Beck, M.D.: Occurence of Coccidioides Immitis in Lesions of Slaughtered Animals. Proc. Soc. Expt. Biol. and Med., 26, (1929): 534.

Notes from Indiana Meeting Indianapolis, Jan. 13-15, 1954

Chronic exfoliative dermatitis presents a complex problem, since it may be due to allergy, fungus, fleas, the proximity of actinic solar rays, or increased activity of the apocrine sweat glands.—*R. B. McClelland, D.V.M., New York.*

• • •

Mortality averages 25 per cent in experimental distemper, 30 per cent in experimental infectious hepatitis, but it averages 60 per cent when the two viruses are used simultaneously.—*C. J. York, D.V.M., Indiana.*

• • •

Dullness, muscular tremors, stiffness of the hind quarters, and a tucked-up abdomen are characteristic of the septicemic stage of leptospirosis in dogs.—*R. E. Witter, D.V.M., Illinois.*

• • •

The snoring dog can be relieved by removing with electrocautery a segment of the tip of the soft palate.—*H. M. Bratt, Sr., D.V.M., Indiana.*

• • •

Luxation of the patella, which is usually to the medial side, is most common in small breeds of dogs; complete removal is a simple, safe, and sure way to avoid the recurrence of luxation.—*J. E. Carver, D.V.M., Indiana.*

• • •

When examining for mange mites, grasp a fold of skin between the thumb and forefinger, place a drop of mineral oil on the skin, rub it in near the active margin of the infected area, then squeeze firmly and scrape the area with a scalpel, mix the scraping on a slide in 10 per cent sodium hydroxide solution, and examine.—*H. D. Owen, D.V.M., Indiana.*

• • •

Only by frequent attendance and participation in organized meetings can we hope to keep pace with the many technological advances which we practitioners must learn to use daily, if our profession is to continue to grow in prestige among the allied medical sciences.—*E. W. Spieth, D.V.M., Indiana.*

• • •

There is only one way to beat socialized or "state" medicine. That is to continue, year after year, to give our clients better service in the form of better diagnosis, better surgery, better treatment, and better facilities — all for a professional fee, but not an exorbitant fee.—*E. W. Spieth, D.V.M., Indiana.*

• • •

Uterine infections associated with infertility in cows are treated with an intra-uterine injection of 200,000 units of crystalline penicillin and 1 Gm. of dihydrostreptomycin in 40 cc. of water. The preferable time for treatment is the day after service.—*W. J. Gibbons, D.V.M., Alabama.*

• • •

The most common sources of fluorosis are (1) aluminum plants which emit effluents as waste products from their stacks consequent to the use of fluorine compounds in the reduction process; (2) phosphate fertilizer plants; (3) feeding raw rock phosphate; and (4) naturally occurring fluorine in water.—*Dennis Sikes, D.V.M., Tennessee.*

• • •

Harsh regulatory methods and undue discrimination against meat and milk products from leptospirosis-infected herds are not justified and should be avoided.—*L. E. Andres, D.V.M., Indiana.*

• • •

One of the first and most striking changes seen in animals given large, acute, or fractional doses of ionizing irradiation is severe encephalomyelitis-like symptoms.—*J. H. Rust, D.V.M., Tennessee.*

• • •

If the veterinary profession is to continue adequately to serve the public welfare it must (1) present a united veterinary medical front; (2) establish a system for reporting communicable diseases; (3) increase the funds for veterinary medical research; (4) establish a closer liaison and coöperation between veterinary medicine and the livestock industry; (5) strengthen and expand public relations programs; and (6) stimulate interest and participation in the civil defense program.—*Brigadier General J. A. McCallam (Ret.), Washington, D.C.*

• • •

Hemolytic icterus of foals is treated by full-scale replacement transfusion (6 to 8 liters), and the foal often shows active resistance before the operation is completed.—*W. R. McGee, D.V.M., Kentucky.*

• • •

Polyarthritis in young pigs is often caused by staphylococcic or streptococcic infection and is manifested by hot, swollen, puffy joints which often contain pus.—*L. P. Doyle, D.V.M., Indiana.*

• • •

Hog cholera virus has provided veterinary medicine with perhaps the most responsive virus known for the production of a lifetime immunity.—*H. W. Dunne, D.V.M., Pennsylvania.*

• • •

A minimum infectious dose of hog cholera may produce a chronic disease, the longer incubation period giving the defensive mechanism almost enough time to overcome the virus.—*H. W. Dunne, D.V.M., Pennsylvania.*

• • •

Swine erysipelas is difficult to evaluate, being widely distributed among apparently normal swine.—*L. P. Doyle, D.V.M., Indiana.*

• • •

The first thought in the correction of enteritis is the feeding of a light, easily digestible ration that is highly palatable.—*G. R. Oldham, D.V.M., Indiana.*

• • •

Four basic nutritional problems of young pigs are (1) robbing; (2) deficiencies in suckling sows; (3) digestive disturbances; and (4) lack of water, salt, and/or mineral.—*H. D. Lidikay, D.V.M., Indiana.*

Outbreaks of Disease in Animals Associated with *Chromobacterium Violaceum*. I. The Disease in Swine

WILLIAM L. SIPPEL, V.M.D., M.S.; GERADINO MEDINA, D.V.M.; MAX B. ATWOOD, D.V.M.

Tifton, Georgia

THE ORGANISM, *Chromobacterium violaceum*, is ordinarily considered to be a nonpathogenic water and soil bacteria. However, Sneath *et al.*[1] list 13 instances of disease caused by this organism occurring in man from 1927 to 1953: 9 were in Malaya, 3 in the United States, and 1 in Europe. Of these cases, 8 were fatal, 2 recovered, and in 3 the outcome was not reported. The authors of this report have not found a record of a natural case in animals since Woolley's[2,3] original description of a pathogenic strain isolated from 3 water buffaloes which died in the Philippine Islands in 1904. It is the purpose of these preliminary reports to draw attention again to the occurrence of *C. violaceum* as a pathogen in animals.

In September, 1952, formolized pieces of swine lymph node and lung were received in the laboratory from Dr. B. E. Carlisle of Camilla, Ga., with a request to examine them for tuberculosis. There were several whitish nodules in the lung tissue. These structures gave a gritty sensation when incised and contained a caseous pus. Sections were not typical of tuberculosis.

Shortly thereafter, some affected pigs were brought to the laboratory, by the owner, for necropsy and other examinations. The history indicated that the pigs had been vaccinated against hog cholera with one of the modified vaccines the previous spring. They had been feeding on corn all summer and had gained well until the middle of August, when the first pigs had died. On September 1, they were turned into a peanut field and deaths continued. They were also receiving tankage and minerals in self-feeders. Water was obtained from a small stream and pond. At the time of the owner's visit to the laboratory on Sept. 25, 1952, 60 of 125 swine had died and 25 more were sick.

The owner said that most of the pigs had died two or three days after he first noticed they were sick, although some ran a more chronic course. The symptoms described were depression, anorexia, "hollow sides," and coughing. The owner thought the fatter hogs were affected more often and died faster than those in poor condition. Only chronic cases were available for study.

Examination of the animals presented for necropsy revealed pigs in fair to poor condition that appeared depressed, had a double expiratory lift, and coughed frequently. One animal had a temperature of 102.8 F. and a white blood cell count of 38,200 per cubic milliliter immediately prior to autopsy. The mandibular and parotid lymph nodes were enlarged and contained numerous, isolated, encapsulated, caseous abscesses. The caseous material was light yellow. A gritty sensation was felt on incising the abscesses. There was an abscess dorsal to the epiglottis which contained caseous material similar to that in the other lesions. There were scattered small abscesses in the adjacent tissue.

The lungs were studded with abscesses varying in size from 5 mm. to 2 cm. in diameter. On incision, these abscesses were similar to those previously described. The lungs were adherent to the thoracic wall in several places (fig. 1). In the spleen, there were two abscesses about 1 cm. in diameter and raised above the surface about 4 mm. They were similar to those found in the lungs. The liver had a few scattered small, white nodules beneath the capsule, which contained a more fluid pus than those previously described. The kidneys were congested, but no hemorrhages or abscesses

Dr. Sippel is with the Department of Animal Diseases, Georgia Coastal Plain Experiment Station, Tifton; Dr. Medina is head of the Diagnostic and Research Laboratory, National Institute of Agriculture, Divisa, Republic of Panama; Dr. Atwood is now practicing in Hawkinsville, Ga.

Published with the approval of the resident director as journal series paper No. 23.

A more detailed account of the disease produced by this organism will be presented to the graduate school of the A. & M. College of Texas by Dr. Sippel.

The technical assistance of Mr. Hughie J. Godwin, and Mr. J. W. Dietrich, of the electron microscope laboratory, Texas A. & M. College, for photographs of the organism, is gratefully acknowledged. Thanks are due Dr. Hilton A. Smith for the photomicrograph of figure 2.

Fig. 1—Nodules in lungs, typical of those seen in chronic field cases.

were found. There were patchy congested areas in the mucosa of the cecum and colon. No changes were observed in the mesenteric or inguinal lymph glands. Cultures in heart infusion broth of the heart blood, kidney, and liver were negative.

A bacillus was recovered from abscesses in the lung and spleen. On ox blood-agar plates, purple to black, smooth, shiny colonies about 3 mm. in diameter grew in twenty-four hours. A broad zone of incomplete *beta* hemolysis was produced. The organism had the following characteristics: rod, 0.5 to 1.0 by 1.5 to 3.0 μ; motile by a single polar flagellum (fig. 2); indole, negative; nitrates, reduced; litmus milk, peptonized, alkaline; H_2S, negative; methyl red, negative; Vosges-Proskauer, negative; acid but no gas from dextrose, trehalose, saccharose, levulose, and mannose; no fermentation in inositol, maltose, salicin, raffinose, xylose, dulcitol, arabinose, galactose, rhamnose, mannitol, sorbitol, lactose, esculin, inulin, and glycerol.

The organism was gram-negative, nonacid-fast, nonspore-bearing, had no capsule, and grew aërobically. A pale violet pigment that became dark purple was produced. A pigmented granular pellicle formed at the surface of broth, and a slimy nonpigmented growth developed in the bottom of the tube. The mediums became turbid and darker, sometimes developing a slight bluish tint. This organism has been tentatively identified as a member of the *C. violaceum* group,[4] although it does not conform completely.

Later, the farm was visited and 10 affected pigs were brought to the laboratory. Examination and necropsy of these animals revealed symptoms and lesions similar to

Fig. 2—Electron photomicrograph of the Chromobacterium causing the disease. x 23,333.3

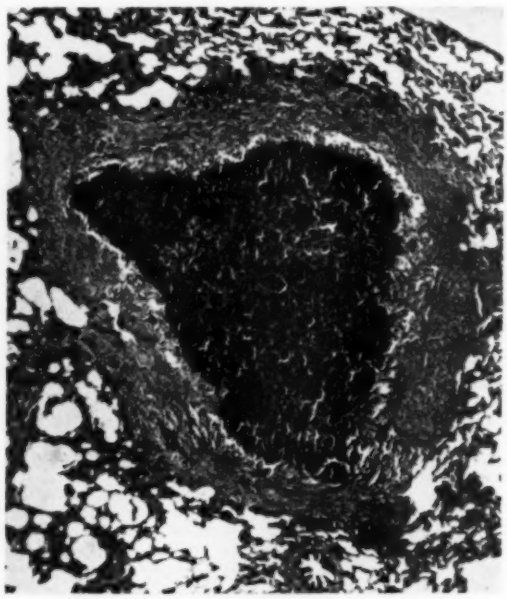

Fig. 3—Histological appearance of lung nodule of a chronic case. x 33.3

those described above. Cultures from lesions in the lungs, spleen, liver, and lymph node abscesses consistently yielded the same organism, usually in pure cultures.

EXPERIMENTAL

Table 1 shows the results obtained from the inoculation of mice, guinea pigs, and swine by various routes with cultures of this organism recovered from swine.

Natural Exposure Trials.—The frequent occurrence of abscesses in the parotid lymph nodes and tonsillar tissue of natural cases suggested the oral route of infection. In an effort to determine if pigs could be infected in this manner, 6 qt. of pond water was inoculated with 5 mm. of a 24-hour broth culture and given to pig 29 in a metal container, as its only drinking water. The pig was taken out of its pen twice daily to be watered. The water was cultured daily for four days, and after this length of time it contained about half as many organisms as when originally inoculated. On the fifth day, 2 liters of pond water were added. At the end of seven days, about 2 liters of water remained in the metal container. At this time, the container was coated with paraffin and 6 qt. of pond water was added. During the second week, 5 ml. of a 24-hour broth culture was added to the water each day. The animal remained well, showed no febrile reaction, and the experiment was terminated at the end of two weeks.

Another pig (pig 28) occupied the same 8-ft. square concrete-floored pen with pig 29 and was given tap water each time pig 29 was given contaminated water. No water was available to the pigs except that furnished twice daily. Pig 28 appeared healthy at the end of the two-week period. Five days following termination of this experiment, pig 28, which had received tap water, was noticed to be off feed, breathing rapidly, and had a temperature of 105.8 F. It was again isolated and observed. Its temperature was above 104.0 F. for five days, after which time the temperature returned to normal and the pig apparently recovered. Cultures of the jugular blood on the second and fourth day of illness were negative.

Pig 28 was killed eight days following recovery, or thirty-two days after the beginning of the experiment. On necropsy, the cervical and mediastinal lymph nodes were reddened. Nodules were observed in the lungs, some of which contained a caseous pus and yielded *C. violaceum* on culture. Other nodules contained a more fluid pus and an organism other than *C. violaceum* was cultured. The method of infection of pig 28 was not determined.

Artificial Exposure.—Pig 21 was given, orally, 0.1 cc. of a 24-hour broth culture of our swine strain of *C. violaceum*. It ran a temperature of 104 F. or higher for six days and recovered. Pig 23 was placed in the pen with pig 21 for contact exposure but remained unaffected. On necropsy of pig 21 twenty days after inoculation, nodules were found in the lungs, from which *C. violaceum* was recovered.

Experimental pigs 2, 20, and 26 died after oral administration of 8.0, 1.0, and 0.2 ml., respectively, of 24-hour broth cultures of our swine strain of *C. violaceum*. Pig 6 was given 4.0 ml. in each nostril. In two to six days these pigs were dead, after an acute course of illness.

The blood, urine, and feces of pig 26 were cultured immediately prior to inoculation, and on the second, third, and sixth day (day of death) following inoculation. All of these cultures were

TABLE I—Results Obtained from the Inoculation of Mice, Guinea Pigs, and Swine by Various Routes with Cultures of this Organism Recovered from Swine

Animal	Dose	Route	Result	C. violaceum recovered	Lesions
2 guinea pigs	1.0 ml. lung susp. from natural case.	i.p.	Survived	0	.....
2 guinea pigs	0.5 ml. lung susp. from natural case.	i.p.	Died	+	.....
3 mice	.....	rubbed on skin scratches	Survived	0	.....
5 mice	.....	i.p.	3 of 5 died.	+	.....
2 mice	0.5 ml.	i.p.	Died in few hours.	+	.....
3 mice	2-3 drops	i.n.	1 died—2 days.	−	.....
			1 died—5 days.	+	.....
			1 died—16 days.	+	.....
EXPERIMENTAL PIGS					
Pig 2	8.0 ml.	orally	Died—54 hours.	+	Acute pneumonia.
Pig 6	8.0 ml.	i.n.	Died—44 hours.	+	Acute pneumonia.
Pig 20	1.0 ml.	orally	Died—4 days.	+	Acute pneumonia.
Pig 21	0.1 ml.	orally	Sick and recovered.	+	Walled-off abscess.
Pig 28	Control in pen with pig 29 receiving contaminated water.	pure H_2O	Sick and recovered.	+	Walled-off abscess.
Pig 26	0.2 ml.	orally	Died—6 days.	+	Pneumonia.
Pig 29	Contaminated H_2O daily, 14 days.	orally	No effect.	0	Not autopsied.
Pig 23	Pen contact with pig 21.	.....	No effect.	0	Not autopsied.

i.p. = intraperitoneally; i.n. = intranasally; 0 = not cultured; + = C. violaceum recovered; − = C. violaceum not recovered.

negative for *C. violaceum.* At necropsy the liver, spleen, kidney, gall bladder, lungs, and heart blood were cultured in heart infusion broth. The lung culture was positive for *C. violaceum;* all others were negative for bacterial growth. Considering the small size of this oral dose (0.2 ml.), it would appear that this organism has a predilection for the lungs.

Autopsy Lesions, Experimental Cases.—The experimental pigs that died after an acute course had peripheral to diffuse hemorrhages of the lymph nodes of the head, neck, and mediastinum. The lymph node lesions of the throat found in natural cases were not reproduced, although small white abscesses were found in these organs in some cases. The principal lesions were in the lungs and included congestion and edema, lobar red hepatization, blood clots in the bronchi, gelatinous edema of the mediastinum, and serosanguineous fluid in the thoracic cavity. Pig 20 had numerous localized areas of gray hepatization that gave the lungs a granular feeling on palpation. Hemorrhagic infarcts were found in the spleen of some animals. The livers and kidneys were congested. The gastrointestinal mucosa had patchy areas of inflammation.

As stated above, nodular caseous abscesses similar to those seen in natural cases were produced in 2 pigs (21 and 28).

When this organism was administered via the intraperitoneal or intranasal route, it killed 8 of 13 mice. Following intraperitoneal injection, 2 of 4 guinea pigs died. *Chromobacterium violaceum* was recovered from most of these animals.

HISTOPATHOLOGY

The field cases have all revealed a chronic type of reaction consisting of foci of caseous necrosis surrounded by a connective tissue capsule. Epithelioid cells are seen frequently in the area around the necrotic tissue. This area is succeeded by a mature fibrous connective tissue capsule (fig. 3).

The outstanding lesions of the acute experimental cases are seen in the lungs and consist of congestion, edema, and hemorrhage. The interlobular septums are prominent due to edema. The cellular reaction is marked by lymphocytes, plasma cells, and macrophages.

SEROLOGICAL TESTS

Tube agglutination tests were run with serums from experimentally inoculated swine and from a random selection of pigs from the affected drove. Tests were performed, using as antigen both living and 0.1 per cent, formolized, 24-hour broth cultures of our swine strain of *C. violaceum.* Best results were obtained using formolized cultures as antigen. The tests were held overnight at 5 C. Titers obtained varied from negative to those positive at dilutions as high as 1:1,280. A young dog and a cow on the farm reacted negatively. A hen had a titer of 1:640. The experimentally inoculated animals reacted to the agglutination test in a conventional manner with pre-inoculation and postinoculation serum samples.

DISCUSSION

Chromobacterium violaceum was encountered at this laboratory on at least one previous occasion, in a case of "acute pneumonia" of swine, at which time it was added to the stock culture collection because of the novelty of its pigment production. It was dismissed as a contaminant at that time. The nodular type of pneumonia seen in the field cases has been seen occasionally by the diagnostic service at the Georgia Coastal Plain Experiment Station, and possibly the true cause of these pneumonias was overlooked. *Chromobacterium violaceum* was recently recovered at this laboratory from a cow dying with lesions of a septicemia. This disease is undergoing further study.

When the organism was initially isolated from the drove in question it was again thought to be a contaminant, the assumption being that all the pathogenic bacteria of animals were well described and that this striking organism could not be the cause of this disease. Not until the organism was repeatedly isolated from the affected drove, and one of us (G.M.) proved it to be pathogenic for laboratory animals, was the true etiology of the disease suspected.

This strain of *C. violaceum* was tested against penicillin, streptomycin, aureomycin, and terramycin.® It was found that 10 units of penicillin per milliliter failed to inhibit growth, whereas 2 *gammas* of aureomycin per milliliter, 4 *gammas* of streptomycin per milliliter, and 39 *gammas* of terramycin per milliliter prevented growth in tryptose broth. Wheat[5] indicates that the recent increase in human infection with *Chromobacterium prodigiosum* (*Serratia marcescens*) may be because the antibiotics have overcome other organisms and "permitted implantation of the highly antibiotic- and sulfonamide-resistant Chromobacterium." Sneath[1] states, "All the strains [*C. violaceum*] we have tested are sensitive to streptomycin, chloramphenicol, aureomycin, and terramycin at concentrations

readily attained in the blood. They are resistant to penicillin and sulfadiazine."

Regarding the route of infection, Sneath found that guinea pigs, mice, and rabbits were susceptible to intraperitoneal inoculation with his strain of *C. violaceum*. He also states, "Animals were not infected when fed on cultures." In contrast, in these experiments a 40-lb. pig was killed with 0.2 ml. of a 24-hour broth culture of *C. violaceum* given orally. Difficulty was experienced in reproducing the chronic disease seen in the field, because of the small oral dose that was lethal. The uniform involvement of the lymph nodes and tonsillar tissue of our field cases suggested the oral or nasal route for natural infection of swine. In this country, the disease in man seems to have resulted from skin or splinter infections. Schattenberg[6] infected rabbits with resultant fatalities, by introducing into their feet splinters previously dipped in cultures of *C. violaceum*.

In conclusion, a statement by Soule[7], in reference to the disease in man, is pertinent: "In consideration of the aforementioned observations, the wide distribution of *Bacillus violaceus* in air, soil, and water should be envisioned as potentially dangerous. If found in diseased processes, this organism should be carefully investigated rather than treated as a contamination."

SUMMARY

1) An outbreak of a disease in swine is described.

2) An organism similar to *Chromobacterium violaceum manilae* (Woolley) was repeatedly isolated from naturally occurring cases of the disease.

3) Chronic cases resembling those occurring naturally, as well as an acute form of the disease, were produced experimentally with cultures of *C. violaceum* recovered from natural cases.

4) Attention is again called to this group of organisms as possible animal pathogens.

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Cortisone's Secondary Ill Effects

Because of its many beneficial effects, the use of cortisone expanded rapidly, but now its ill effects are being reviewed. Apparently, whenever a vertebrate host has been parasitized by an invertebrate, cortisone treatment is detrimental to the host. However, this may often be obscured by the symptom-masking effect of the drug. Cortisone apparently enhances all infections whether they be bacterial (spirochaetosis, tuberculosis) or due to a virus, fungus, or to protozoa but its effect on helminths remains doubtful. This holds true for man and all experimental mammals.

Six mechanisms which might explain cortisone's action are suggested:

1) Direct action on the organisms—but that cortisone could stimulate such a diverse group is improbable;

2) Direct effect on polymorphs—but they have no defensive action against fungi, viruses, or protozoa;

3) Suppression of the formation of antibodies—but cortisone enhances virus infection in chicken embryos where no antibodies are produced;

4) Interference with the local defense mechanism such as inflammatory response which cortisone does hinder—but lack of local inflammation could not account for cortisone's promotion of septicemias;

5) Its effect on serum components which take part in defense against infection such as preformed antibodies, hyaluronidase inhibitor, and others—but this does not seem likely;

6) Its effect on the cells of the reticuloendothelial system which clears particulate matter from the blood. This could explain cortisone's action, since experiments in blockading the system similarly promotes local infection and the absorption of toxins. However, the mechanism may be much more fundamental, such as a different effect on the protein metabolism of vertebrates and invertebrates.—*Brit. M. J., Feb. 13, 1954.*

Enterotoxemia causes losses in lambs from 2 days of age to their feedlot age. The antiserum as a preventive is effective for only one to three weeks.—*Montana State Coll. Farmer, Feb., 1954.*

Treatment of Equine Colic with Neostigmine Methylsulfate

W. W. GARVERICK, D.V.M., and GEORGE R. BURCH, D.V.M.

New Augusta, Indiana

VETERINARIANS who engage in equine practice are frequently called to treat intestinal stasis with tympany in horses. The condition may be complicated by impaction of the cecum or colon. Treatment has varied from "balling gun" to stomach tube medication, with injections of arecoline hydrobromide, physostigmine (eserine), and lentin®* used to stimulate peristalsis. However, experience indicates that these drastic hypodermic purgatives should never be given until a thorough rectal examination has eliminated the possibility of a fibrous impaction of the small colon.

The organic compound, neostigmine methylsulfate, has been routinely used parenterally in the human patient to prevent and treat postoperative atony and distention of the intestines and bladder. A dose of 0.25 to 0.5 mg., which is generally used, produces fecal and urinary evacuation in about thirty minutes. The dose is often repeated in two to five hours. This dosage level is safe and free from toxic signs.

Stiglyn,®** a solution containing 2 mg. of neostigmine methylsulfate per cubic centimeter, was injected subcutaneously in horses to gain information concerning its ability to cause evacuation of feces and gas in both normal animals and clinical cases of colic.

CLINICAL STUDY

Six normal, mature horses were injected subcutaneously with 1 mg. of the drug per 100 lb. of body weight, in order to determine toxicity at this dose level (table 1). Four of the animals received a second injection, after an interval of twenty-four hours or longer, to see whether certain animals would show greater intestinal activity than others at a given dose. The work mare (No. 3 and 4 in table 1) and the gelding (No. 5 and 6 in table 1) were pastured together and injected at the same time. It would seem that the injection produced greater intestinal response in the gelding than in the mare. On the first test, the gelding had seven stool passages and the mare had three; while on the second test, the passages were six and two, respectively.

During a three-year period, more than 200 cases of equine colic have been treated with the drug, using a dosage of 1 mg./100 lb. of body weight. The following cases are typical:

Case 1.—A 5-year-old Standardbred gelding, weighing 1,085 lb., was brought in from pasture with symptoms of colic, *i.e.*, rolling, uneasiness, and poor peristalsis. An injection of 5.25 cc. (10.5 mg.) of stiglyn was given. This treatment resulted in five stool passages during the following forty-nine minutes. A second dose, given two hours after the first, was followed by two stool passages in fifty-three minutes. The horse was turned out to pasture completely recovered three and one-half hours after initiation of treatment. When released, he ran and kicked, and soon started to eat grass.

Case 2.—A 10-year-old work mare, weighing 1,185 lb., had typical colicky pains. She was given 6 cc. (12 mg.) of stiglyn. This injection resulted in six stool passages in fifty minutes, with large quantities of gas. The mare was completely normal one and one-half hours after the injection.

Case 3.—A 5-year-old Standardbred gelding, weighing 1,110 lb., was brought in from pasture with severe colicky pains and given 5.5 cc. (11.0 mg.) of stiglyn. The injection resulted in three stool passages in the next thirty minutes. This injection did not entirely abolish symptoms of colic, so a second injection was given two and one-half hours after first treatment. Within an hour, the horse was acting normal and nickering to be turned out of the box stall. Two stool passages resulted from the second injection.

Case 4.—A 10-year-old Thoroughbred mare, weighing 1,300 lb. (est.), refused her evening meal, was uneasy, and continually looked around at her abdomen. She was given 6.5 cc. (13.0 mg.) of stiglyn and several stools occurred in the follow-

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*Lentin is a trade-marked product of Merck & Co., Rahway, N. J.

**Stiglyn is a trade-marked product of Pitman-Moore Co., Indianapolis, Ind.

TABLE I—Stool Passage of Normal Horses Following an Injection of Neostigmine Methylsulfate at the Rate of 1 mg./100 lb. of Body Weight

No.	Horse	Weight (lb.)	Dose	Injection time	Stool passage	Remarks
1	Standardbred gelding	1,190	12.0 mg. (6.0 cc.)	1:30 p.m.	1:45, 2:05, 2:10, 2:15 2:20, 2:25, 2:35, 2:45	———
2	Pony	575	6.0 mg. (3.0 cc.)	1:10 p.m.	1:40, 1:50, 2:20, 2:42 3:10	———
3	Work mare	1,300	13.0 mg. (6.5 cc.)	9:50 a.m.	10:04, 10:25, 11:05	10:35, ate ½ gal. oats greedily.
4	Work mare	1,300	13.0 mg. (6.5 cc.)	2:19 p.m.	2:43, 3:04	———
5	American Saddlebred gelding	1,235	12.3 mg. (6.2 cc.)	9:51 a.m.	10:12, 10:17, 10:19 10:21, 10:30, 10:48 10:59	10:35, ate ½ gal. oats greedily.
6	American Saddlebred gelding	1,235	12.3 mg. (6.2 cc.)	2:20 p.m.	2:31, 2:42, 2:57, 3:04 3:10, 3:22	———
7	American Saddlebred mare	1,300	13.0 mg. (6.5 cc.)	2:06 p.m.	2:37, 2:38, 2:49, 3:00	———
8	American Saddlebred mare	1,300	13.0 mg. (6.5 cc.)	1:14 p.m.	1:59, 2:25, 2:27, 2:29	———
9	Standardbred gelding	1,060	10.5 mg. (5.25 cc.)	2:07 p.m.	3:25	Passed large quantities of gas.
10	Standardbred gelding	1,060	10.5 mg. (5.25 cc.)	1:15 p.m.	1:45, 1:54, 1:57, 2:22	———

ing hour. The mare was eating hay in one and one-half hours.

Case 5.—A 30-year-old American Saddlebred gelding, weighing 1,000 lb. (estimated), with mild colic signs, was given 5 cc. (10 mg.) of stiglyn. No stools resulted from this treatment and no improvement was evident in three hours. The horse was then given antiferment and oil by stomach tube. The next morning, it appeared to be free of symptoms.

Case 6.—A 14-year-old Percheron brood mare, weighing 2,200 lb. (estimated), was mildly colicky. She was given 11 cc. (22 mg.) of stiglyn. Several stool passages occurred during the following hour and an uneventful recovery resulted.

COMMENT

The subcutaneous injection of stiglyn at the rate of 1 mg./100 lb. of body weight has been highly effective in treating equine colic, and this dosage can be recommended for routine use. Since the weight of the animal must usually be estimated, lack of stool passage may be attributed to inadequate dosage; or, as demonstrated in table 1, this dose can have a variable effect in animals. The amount of fecal material present in the cecum and colon undoubtedly influences the number of stool passages that may occur following treatment. In accordance with observations on human patients, many horses eliminated large amounts of gas in addition to fecal matter.

The recommended dosage schedule does not interfere with the appetite or cause excessive salivation. Normal horses will eat at any time following the injection. Commonly, after the second or third stool passage, the feces are not formed and subsequent evacuations may be soft and watery. The injection can be repeated in two hours with safety. A few animals in this series were given mineral oil, water, and antiferments via a stomach tube, after the routine injection failed to abolish the symptoms of colic. Of special clinical interest, was the observation that not one of the sick animals treated with this drug showed any evidence that the medication aggravated or increased the pain.

Overdosing, manifested by restlessness, purging, and salivation, is counteracted with atropine.

SUMMARY

The clinical use of stiglyn, a solution of neostigmine methylsulfate, in horses is described. A subcutaneous dose of 1 mg. of the drug per 100 lb. of body weight was found to be safe and effective for evacuating feces and gas in a series of more than 200 cases of equine colic. This injection did not aggravate or increase the pain in any of the cases treated.

An intravenous injection should be given in the right jugular vein, with the needle directed toward the heart. If a venous slough should result, it would not involve the esophagus.—*A. G. Madden, D.V.M., Ohio.*

NUTRITION

Antifoaming (Defrothing) Agents in the Treatment and Prevention of Bloat

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EVALUATING the bloat-prevention activities of some of the antifoaming agents is practically impossible. Bloat is too insidious in nature; it can not be produced experimentally at will; and our knowledge of the causes is too inadequate to permit anything but a rough estimation of prophylaxis.

Surface-active agents should relieve most cases of bloat and would justify extensive use of them should the following conditions exist in most bloated animals:

1) if all (or most) bloat were frothy in nature;

2) if there were no inhibition, other than mechanical, of the eructating mechanism;

3) if all surface-active agents were active in all or most cases of bloat; and

4) if wide dispersal of the agent in a severely distended rumen were possible.

Unfortunately the evidence, as has been discussed previously,[2] does not permit any such conclusions.

Clark,[1] in South Africa, has tested in a limited way the effectiveness of various antifoaming agents in the treatment and prevention of experimental and clinical bloat and feels that some of these agents have value. Quin *et al.*[4] have reported on the use of one of the surface-active agents, but their report is clouded with collateral medication and trocharization so that it offers little more than an indication, certainly not definite proof.

Nichols[3] states that administration of some of the common household detergents and surface-active agents cleared the paunch of froth. However, some were not desirable. Their use is not without difficulties and dangers but, nevertheless, it may be justified if it will save cows from bloat. It remains to be determined whether some detergents are toxic to cows and whether the detergents may interfere with digestibility of the feed and other important functions associated with microbial activity.

The following is a brief *in vitro* evaluation of four commercially available agents for which antifoaming properties are claimed. It must be admitted that the results obtained with the methods used can only be indicative and may have but limited bearing on what happens *in vivo* and in clinical cases of bloat. Two of the products were silicone suspensions, another was turpentine, and the fourth a turpentine mixture. Rumen liquor was shaken in a standard procedure for two minutes and immediately afterward the substance under test was added. The extent

TABLE 1—Foam-Dispersing Power at Therapeutic Concentrations, Using 50 ml. of Rumen Liquor Standard Shaking Procedure, and Time Limit of Two Minutes

Product	Quantity (ml.)	Efficacy	Recommended dosage
Rumonal	0.015	+++	40 cc. of 5% silicone susp.
Tympanol	0.03	++++	100 cc. of 1% silicone susp.
Turpentine	0.015	++	± 30 cc.
Turcapsol	0.015	++	± 30 cc.

TABLE 2—Ability to Prevent Reconstitution of Foam at Therapeutic Dosage Levels—Standardized as in Table 1

Product	Quantity (ml.)	Efficacy
Rumonal	0.015	++
Tympanol	0.03	++
Turpentine	0.015	+++
Turcapsol	0.015	++++

TABLE 3—Ability to Prevent Reconstitution of Foam at Double the Therapeutic Concentration

Product	Quantity (ml.)	Efficacy
Rumonal	0.03	++
Tympanol	0.06	++
Turpentine	0.03	++++
Turcapsol	0.03	++++

From the Department of Physiology, New York State Veterinary College, Cornell University, Ithaca, N. Y.

This article was provided by the AVMA Committee on Nutrition.

of the disappearance of the froth was graded by rating from 0 to 4 plus, with the latter indicating complete defoaming action. The treated rumen liquid was then again shaken and the ability of the treatment to prevent frothing determined. The results are presented in tables 1, 2, and 3.

The efficacy of the silicone products was higher than the turpentine products, based on foam dispersal when added after shaking in quantities comparable to recommended dosage. However, the reverse was true when judged on ability to prevent reconstitution of foam when the rumen liquor was reshaken. This held true even when double the therapeutic concentration of the agents was present. Thus, marked differences in the efficacy of the four products was not found.

The results indicate that certain antifoaming agents are effective *in vitro*, both in defoaming and preventing foam formation in fresh rumen ingesta; however, *in vivo* effectiveness will have to be determined objectively on actual cases of bloat.

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Antibiotics for Dairy Calves

At the Maine Agricultural Experiment Station, 19 calves taken from their dams when 24 hours old were placed in one of four groups. All were given the same adequate ration, with those in group 1 serving as controls while groups 2 and 3 were given 1 mg. per pound of body weight, daily, of oxytetracycline and chlortetracycline, respectively, and group 4 was given a mixture of four antibiotics—the above two plus bacitracin and penicillin. Twelve weeks later when the antibiotics were removed, the groups had gained 91, 108, 106, and 117 lb., respectively.

While the controls developed no illness, they were affected with more mild scouring as a result of which the other groups were in better condition. However, in the next four weeks the groups which had been on oxytetracycline and chlortetracycline made little or no gain and their coats became rough. Meanwhile, the controls gained an average of 28 lb. and the group on mixed antibiotics gained 12 lb. When 7 months old, the average gain per group was 122, 109, 112, and 140 lb., respectively. Only the group on mixed antibiotics had done better than the controls.—*Ayrshire Dig., Dec. 15, 1953.*

Utilization of Inorganic Sulfur as Shown by Radioisotopes

The importance of microbial synthesis in the gastrointestinal tract of sheep was shown in a radioisotope study of the utilization of inorganic sulfur. Sheep given oral doses of sodium sulfate containing radioactive sulfur were kept in metabolism stalls for four days, then slaughtered. During that time, 31 per cent of the sulfur ingested was excreted in feces and 49 per cent in the urine. All analyzed tissues contained some of the sulfur, 1.8 per cent being in the liver, 3.2 per cent in the blood, and a high concentration in the wool. These tissue concentrations are much higher than in a similarly treated rabbit, probably because of the higher level of microbial synthesis in the ruminant.—*Rep., Chief, Bureau of Animal Industry, 1953.*

Utilization of Sulfur by Lambs.—The following symptoms were observed in sulfur-deficient lambs: poor appetite, loss of wool, excessive lacrimation, cloudy eyes, profuse salivation, dullness, weakness, emaciation, and death. The sulfur-supplemented lambs, in contrast, were strong, alert, and had good appetites.—*J. Anim. Sci., 1952.*

Parasites Affect Digestion of Lambs

When 6 lambs subclinically infected with *Trichostrongylus axei* were compared to their parasite-free twin controls, the digestibility of crude protein was significantly lowered in the former but the crude fiber fraction seemed unaffected. Furthermore, the infected lambs exhibited an 8 per cent depression of appetite and absorbed 10 per cent less of the food nutrients than did the controls.—*J. Comp. Path. and Therap., Jan., 1954.*

The Effect of Diet on Noncontagious Posthitis of Sheep

The prepuce of the sheep is subject to two forms of chronic ulceration: the external, which is unimportant, and the internal, or sheath rot, which is serious. The latter must be differentiated from the contagious or transmissible form. In sheath rot, found chiefly in older wethers, the prepuce is inflamed and may be occluded by necrotic detritus. When the orifice is patent, the sheep's general condition is not affected but, when occluded, the animal is in distress, loses weight, and may die from uremia. The first lesions are on the sites most intimately in contact with urine.

The condition is most prevalent when sheep graze on rich subterranean clover or highly leguminous pastures, and is practically unknown on nonleguminous pastures. Several wethers developed lesions in one to two weeks when experimentally fed a high vegetable protein diet which produced a highly alkaline urine. However, when field cases were brought to the laboratory, where they seldom ate well for several days, the lesions healed rapidly regardless of the urine reaction which, in some animals, was kept alkaline by drenching daily with sodium bicarbonate. Field cases, when maintained with their affected mates, improved when their diet was reduced by muzzling. Chronic cases recovered rapidly after excision of a V-shaped portion of the prepuce, leaving the tip of the penis exposed.

When samples were needed, urination was induced by temporary occlusion of the nostrils.

When 22 wethers were continuously drenched daily with 1½ oz. of sodium bicarbonate, 6 deaths resulted, believed to be due to alkalosis tetany.—*Austral. Vet. J., Oct.-Dec., 1953, and Jan., 1954.*

Stilbestrol and Ruminant Growth

Steers in the feedlot or on pasture fed rations supplemented with concentrates made greater gains when treated with stilbestrol implants than did controls. Heifers made a less marked response. Consumption and utilization of feed increased in all cases. The effect of treatment on the endocrine gland included a significant increase in the size of the pituitary and adrenal glands, a marked increase in the growth hormone of the hypophysis in heifers, a slight increase in the thyroids of steers but a reduced thyroid in heifers, and no effect upon the weight of the ovaries; corpora lutea formation was depressed. The carcass grade was lower in treated animals. The chief signs of treatment were increased masculinity and mammary gland development. Several treated heifers developed a prolapse of the vagina.—*J. Anim. Sci. Feb., 1954.*

Synthetic Milk for Pigs.—In the past two years there has been much interest in synthetic substitutes for sow's milk. After many trials, the University of Minnesota reports that the value of such substitutes is chiefly as creep feeds to supplement the sow's milk when, at about 10 days of age, the pigs start eating. In this instance, the feeding of synthetic milk substitutes is most likely to be economical, the nursing pigs sometimes gaining 1 lb. for every 3 lb. of synthetic feed consumed.—*Hog Breeder, Sept., 1953.*

Anemia from Onions Fed to Animals

When onions, raw or cooked, formed a considerable part of the ration, anemia developed in dogs and fowl at five days, in rabbits at six to ten days, and in 2 goats after twelve days. When fed to a pregnant goat, bitch, and rabbit, the young were normal at birth but the pups developed anemia at four days, probably due either to milk changes in the anemic bitch or to low iron reserves in the pups.—*Vet. Bull., Feb., 1954.*

Bacterium Coli as a Food Supplement.—The protein in heat-killed *Bacterium coli* organisms can effectively replace about half of fish meal protein in the diet for young rats. In both chicks and young rats, the two proteins seem to have a complementary action.—*Vet. Bull., Jan., 1954.*

Vitamin A deficiency predisposes the newborn to infections; therefore, the young from a deficient dam should be protected by sulfonamides until the deficiency is made up.—*Proc. Fifteenth Internat. Vet. Cong., Stockholm, 1953.*

Try a low protein ration on the dog with stubborn dermatitis; overtreatment is a common mistake.—*R. B. McClelland, D.V.M., New York.*

EDITORIAL

Status of Leptospirosis as Caused by *Leptospira Pomona* Infection

Interest in leptospirosis as a disease of economic importance in cattle has been reflected in the number of review articles that have appeared in our journals recently. It seems of importance, therefore, to appraise the current situation* and to feature the important developments of knowledge about leptospirosis.

1) It was recognized by Jungherr[1] that leptospirosis occurred in cattle in Connecticut, by Marsh[2] in Montana, by Mathews[3] in Texas, and by Baker and Little[4] in New Jersey.

2) Isolation of the organism causing leptospirosis in cattle by Baker and Little[4] at the Rockefeller Institute was accomplished, and clarification of the signs of illness, pathology, and method of spread.

3) The Leptospira occurring in cattle was classified as a type serologically indistinguishable from *Leptospira pomona* by Gochenour and Yager[5] at the Army Medical Center.

4) A practical diagnostic test was developed by York[6] at Cornell University making use of the complement-fixation reaction. This test was found to give no false reactions but is limited in not revealing all cases that have recovered from leptospirosis since complement-fixing antibodies persist for only a matter of months, not years. The practical usefulness of this test has been demonstrated in New York State where it serves as the diagnostic method of choice.

5) A vaccine was developed by York and Baker[7] at Cornell University. This vaccine has demonstrated an immunizing capacity that will interrupt the spread of disease in a herd of cattle or protect exposed cattle. This vaccine,† produced commercially, is licensed by the Bureau of Animal Industry, and is available to veterinarians.

6) It was recognized by Roberts and York[8] at Cornell University that leptospirosis occurs in horses under farm conditions. From infected horses in New York State, the organism was isolated for the first time in this country.

7) Studies of leptospirosis in swine by Burnstein and Baker[9] at Cornell University have shown that the infection is mostly inapparent in this animal. Pigs, however, were found to harbor Leptospira for longer than five months in their kidneys and during this time to eliminate numerous organisms in their urine. Also, it was shown that 20 per cent of the pigs coming to slaughter in the Middlewest have had the disease. Since cattle eliminate few organisms in their urine and only over a period of less than three months, it was concluded that swine are important reservoirs and spreaders of *L. pomona.*

In conclusion, it should be realized that better diagnostic tests might be developed and better vaccines might be introduced. Until this is done, however, the present diagnostic test and the vaccine now available will aid in preventing losses from leptospirosis, as has been demonstrated already by practicing veterinarians in coöperation with the diagnostic laboratory in New York State.

Much important work remains to be done and of primary interest is a determination of the importance of *L. pomona* as a human pathogen. Veterinarians in the public health service should be encouraged to conduct significant surveys to determine the comparative health hazard of infected cattle in contrast to infected pigs, especially since animal work done thus far indicates a high percentage of pigs are infected and pigs spread more organisms over a longer period of time than cattle.—JAMES A. BAKER.

*This summary of the problem of leptospirosis in domestic animals is published because of the many inquiries for information on the subject; also see the article on page 423 and the abstract reporting some revealing research on leptospirosis in swine on page 426.

†Leptogen®—Pitman-Moore Co., Indianapolis, Ind.

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The Rabies Trend Continued in 1953

The number of rabies cases reported annually in the United States from 1938 to 1953, inclusive, have been remarkably constant, varying from 7,165 in 1942 to 10,872 in 1946, an average of 8,709 cases per year.

In 1953, the total was 8,837 cases (*see* map). However, this constant total denotes significant trends in the species incidence of rabies. Canine cases have increased slightly since 1950, but the 5,688 cases are low compared to 9,067 in 1944 and a 16-year average of 6,837. The reduction in canine rabies is encouraging. However, the picture is less favorable when it is revealed that 1953 set a new high in bovine cases with 1,012, in feline cases with 538, and is second highest in miscellaneous cases with 1,479 (1952 had 1,674 such cases).

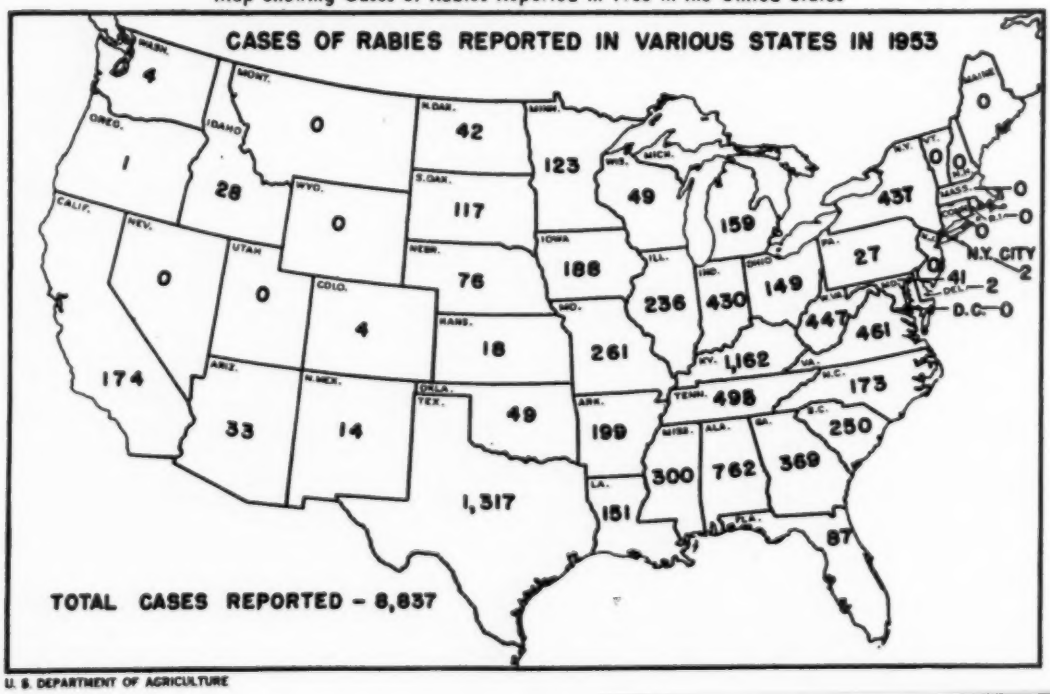
The 1953 miscellaneous category includes rabies in 19 species, 16 of which could be classed as biting wild animals. In this category, foxes lead with 1,033 cases, and then skunks, 319; raccoons, 40; squirrels, 23; bats, 8; bobcats, 7; rats, 5; and wolves, coyotes, and muskrats, 4 cases each. Not only has there been a marked, steady increase in miscellaneous cases from the 44 reported in 1938, but there probably are several rabies deaths in these wild animals for every one which is found and reported.

In ten states, less than a third of the reported rabies cases were in dogs. New York had 44 dog, 42 cat, 129 fox, 1 skunk, and 5 raccoon cases in its 437 total, 210 of which were cattle. Of Pennsylvania's 27 cases, 9 were dogs. Canine vaccination doubtless is a factor there but not in the block of North Central states, including the Dakotas, Nebraska, Kansas, Minnesota, Wisconsin, and Iowa where only 12.7 per cent of the 613 cases were dogs. The species breakdown in the seven states includes dogs, 88; cats, 87; cattle, 141; sheep, 1; swine, 14; foxes, 7; skunks 226 (36.8%); raccoons, 12; squirrels, 12; rats, 2; muskrats, 4; mink, 1; opossum, 1; civet cats, 2; rabbits, 8; and mice, 7.

By contrast, in 1943, these seven states had only 56 cases of which 18 were dogs, 9, cats; 14, cattle; 4, horses; 7, foxes; and 4, skunks. It is not easy to understand how rabies can make such an increase among other species yet affect so few dogs. Of Florida's 87 cases, 24 were dogs; 15, foxes; 10, raccoons; and 7, bats.

Of the 14 cases reported in man in 1953 (compared to a 16-year average of 26 cases), 13 were in southeastern states and 1 in New York.

Map Showing Cases of Rabies Reported in 1953 in the United States



U. S. DEPARTMENT OF AGRICULTURE

CURRENT LITERATURE

ABSTRACTS

The Duct System of the Canine Pancreas

The pancreatic duct system in 50 dogs was injected postmortem with radiopaque mediums in order to visualize: (1) the pattern of the ramifications of the duct; (2) the presence of interductular anastomoses; and (3) the number of openings into the duodenum. Pantopaque (ethyl-iodo-phenyl undecoate) was used for the injection and the results recorded on Ilford's ilfex x-ray film. The common type (84%) have two openings in the duodenum, with interductal anastomosis present in the pancreas; 8 per cent had only one duct patent (duct of Santorini); and another 8 per cent had three duct openings to the duodenum. The bearing of the duct anatomy on the pathogenesis of pancreatitis is briefly discussed in the human and canine species. —[*S. W. Nielsen and E. J. Bishop: The Duct System of the Canine Pancreas. Am. J. Vet. Res., 15, (April, 1954): 266-271.*]

The Teeth of the Ox in Clinical Diagnosis

Fetal calves were studied to determine the essentials of bovine dental histology and embryology. The results of the study as set forth are fundamentally the same as recent concepts found in human dental literature, varying, however, morphologically and dynamically. The kymographic properties of developing teeth are of value to the veterinary clinician in diagnosing dental irregularities and pathology.—[*Norman L. Garlick: The Teeth of the Ox in Clinical Diagnosis. I. Developmental Anatomy. Am. J. Vet. Res., 15, (April, 1954): 226-231.*]

Controlled Feeding of Fluorine to Dairy Cattle

Beginning at 2 years of age, Holstein-Friesian grade cows ingested fluorine daily, as sodium fluoride, at levels of 0.3, 1.0, 1.5, 2.0, and 2.5 mg. per kilogram of body weight through two lactations over a period of three years. The cattle were milked twice daily and kept under conditions of practical dairy herd management. There was no significant reduction in milk production or a depression in body weight, nor was there any evidence of diarrhea, harsh coat, lapping of water, or elongation of the toes which might have been attributed to the prolonged ingestion of fluorides. Cows fed 2.0 or 2.5 mg. of fluorine per kilogram of body weight per day developed marked mottling, staining, and wear in the fourth pairs of incisors. At the 1.5-mg. level, these effects on the fourth incisors were less pronounced. In the group fed 1.0 mg. of fluorine, only slight mottling and straining occurred. The pathological conditions were less frequent and less intensive in the third incisors. The first and second incisors of all cows, with one exception, remained free of tooth changes. Slight exostosis developed in 3 of the 4 cows fed the highest level of fluorine.—[*H. J. Schmidt, G. W. Newell, and W. E. Rand: The Controlled Feeding of Fluorine, as Sodium Fluoride, to Dairy Cattle. Am. J. Vet. Res., 15, (April, 1954): 232-239.*]

Glomerular Lipoidosis in the Dog

The occurrence of abundant lipid deposit within the glomeruli of an otherwise normal dog is reported. To our knowledge, there has been no previous recorded reference to such change in the literature. The significance of such a finding is great if one is to avoid ascribing experimental significance to such a lesion. The lesion is termed glomeruler lipoidosis.—[*Edwin Fisher and Bernard Fisher: Glomerular Lipoidosis in the Dog. Am. J. Vet. Res., 15, (April, 1954): 285-286.*]

Costal Marrow in the Horse

The normal cytological picture of the bone marrow of the horse was determined. Samples were obtained from 7 horses by drilling into the rib and aspirating about 1 cc. of marrow. A study was made of the healing process of the drill hole in horse ribs and photomicrographs were made to illustrate the progress of repair. Repair of the bone was almost complete in seven weeks and all external indications had disappeared long before that. Five hundred cells were counted for the differential count on the marrow smears. The mitotic figures encountered per 500 cells were recorded and the megakaryocytes were counted in a 300-sq. mm. area. The myeloid-erythroid ratio was determined. Cytological studies were made of the marrow cells and color comparisons were made with colors in the Munsell "Book of Color." The myelogram for the horse is given.—[*Lois M. Calhoun: A Cytological Study of Costal Marrow. I. The Adult Horse. Am J. Vet. Res., 15, (April, 1954): 181-196.*]

Immunity in Cutaneous Bovine Papillomatosis

The immunity following the injection of commercial wart vaccines of tissue and chicken embryo origin was studied in 82 young calves. The immunity was challenged by intradermal and scarified skin inoculation with three preparations of ground wart tissue containing active virus. Three types of growth were produced. One was typical of the epithelial papilloma with some connective tissue reaction. The second and third

U. S. DEPARTMENT OF AGRICULTURE

types consisted principally of a connective tissue response which differed only in degree. A partial degree of immunity was produced in calves immunized with wart vaccine of tissue origin. No protection was demonstrated in calves which received wart vaccine of chicken embryo origin. The duration of immunity was tested in 18 animals more than a year after experimental immunization and challenge. Only a connective tissue response was obtained in 13. Some animals in a herd of 58 cows (3½ years old) recovered from, or still affected with, natural papillomas, developed connective tissue response after experimental exposure. The animals that had recovered from two attacks of the disease showed less response of connective tissue than those recovered from a single episode of the infection.

Some evidence suggests strain specificity with respect to immunity.

While both epithelium and connective tissue were stimulated by the agent of bovine papillomatosis, only the epithelium appeared to become distinctly immunized as a result of experimental immunization or natural infection.—[*V. Bagdonas and C. Olson: Observations on Immunity in Cutaneous Bovine Papillomatosis. Am. J. Vet. Res., 15, (April, 1954): 240-245.*]

Reagents for the Standardization of Clostridium Bacterin

The preparation of an *epsilon* toxoid and a trypsin-activated *epsilon* toxin, partially purified by ammonium sulfate, and dried by lyophilization, is described. The toxiod has been shown to be stable for at least eleven months and the toxin for at least twenty-eight months. The use of these reagents for the standardization of commercial bacterins is suggested.—[*L. F. Schuchardt, J. Munoz, and W. F. Verwey: Partially Purified Dried Epsilon Toxin and Bacterin. Am. J. Vet. Res., 15, (April, 1954): 316-318.*]

Regurgitation in the Ruminant

Employing segment capsule manometers, and a photokymograph, a study was made of the mechanism of regurgitation in the ruminant. Accurate tracings were made of intranasal pressure, intratracheal pressure, bolus passage in the esophagus, abdominal movements, and jaw movements. The experimental animals were a steer with a permanent rumen fistula and 2 normal cows.

Figures compiled from the records of 60 regurgitations indicate that the phenomenon is extremely precise. The negative pressures involved in regurgitation appear to extend from 120 to 300 mm. of bromoform. The tracings indicate that a positive pressure occurs before and after regurgitation until the glottis opens. Forced regurgitations indicate that a reflex due to summation of nerve impulses is involved. The regurgitation could be invoked manually at any time during the rumination cycle.

Records were obtained during regurgitation showing that the jugular pulse decreases when the negative pressure of regurgitation is sustained and reaches sufficient proportions to significantly increase the flow of blood from the jugular veins toward the heart.—[*H. G. Downie: Photokymographic Studies of Regurgitation and Related Phenomena in the Ruminant. Am. J. Vet. Res., 15, (April, 1954): 217-223.*

Penothiazine in Unweaned Calves

Phenothiazine was given to healthy, unparasitized, unweaned calves. One group received 1.0 Gm. daily, one group received 12.5 Gm./100 lb. of liveweight, and one was a control group. The tests were repeated three different years, the tests being respectively 109, 106, and ninety-seven days. The average daily weight gain for the three years' test was 1.97 lb. for the group receiving the 1 Gm. daily; 1.98 for the group receiving 12.5 Gm./100 lb. of liveweight each three weeks; and 1.98 for the control groups. Phenothiazine did not influence daily gain under conditions of this experiment.—[*R. D. Turk, J. H. Jones, and E. K. Crouch: Phenothiazine in Unweaned Calves. Am. J. Vet. Res., 15, (April, 1954): 224-225.*]

Cerebrospinal Fluid Pressure of Swine

A method is described for determining the cerebrospinal fluid pressure of pigs by lumbar puncture and the use of an Ayer spinal fluid manometer is described. The average cerebrospinal fluid pressure of normal swine of varying ages and weights was 109.5 mm., with a range of values from 80 to 145 mm. The values of pigs deficient in vitamin A was determined during various stages of deficiency. An increase of cerebrospinal fluid pressure up to 220 mm. was observed in vitamin A-deficient swine.—[*D. K. Sorensen, T. Kowalczyk, and J. F. Hentges: Cerebrospinal Fluid Pressure of Normal and Vitamin A-Deficient Swine as Determined by a Lumbar Puncture Method. Am. J. Vet. Res., 15, (April, 1954): 258-260.*]

Aerosol Transmission of Newcastle Disease in Chickens

Susceptible 6- to 8- week old chicks were readily infected with aërosols created by a No. 40 DeVilbiss nebulizer. Signs of disease appeared in the chickens in three days and death occured in five to seven days. Virus was recovered from the air in the cages which housed the chickens on the third, fourth, and fifth days after exposure. Air samples were drawn through a liquid impinger, a paper filter, and a gelfoam filter. Virus was recovered by all three methods in embryonating eggs. In some instances, it was necessary to repass the isolates in embryos in order to demonstrate hemagglutinins. It was estimated that there was enough virus in the air during the infective period for five to 50 particles a minute to pass into the lungs of birds breathing the air. A second group of susceptible chickens was exposed beginning on the first day to air from the cages housing the

aërosol-infected chickens. On the average, this group developed signs on the eighth day or five days after the start of the infective period. There was greater variation in the incubation time and in the development of the disease in the second group.—[*S. K. Sinha, R. P. Hanson, and C. A. Brandly: Aerosol Transmission of Newcastle Disease in Chickens. Am. J. Vet. Res., 15, (April, 1954): 287-292.*]

Effects of Certain Chemicals on Eggs and Larvae of the Canine Hookworm

One hundred twenty-four experiments involving 2,350 cultures of dog hookworm *(Ancylostoma caninum)* larvae were conducted in testing the effects of nine chemicals on the larvae. Ethylene dibromide, dowfume N, and dowicide G were effective when sprayed on the culture, provided the cultures were covered. DN I, benzene hexachloride, and crude rotenone were found to be effective only when very large amounts were used. DN III, premerge, and chlorodan were not effective, and pure rotenone produced poor results.—[*J. Teague Self and Homer T. Russell: The Effects of Certain Chemicals on Eggs and Larvae of the Canine Hookworm (Ancylostoma Caninum). Am. J. Vet. Res., 15, (April 1954): 281-284.*]

Corneal Healing in the Dog

Beta radiation of experimentally injured and infected canine corneas usually resulted in a delay of the healing process when irradiation was administered shortly after the experimental injury. The majority of the canine corneas that were abraded and infected with *Pseudomonas aeruginosa* cultures healed spontaneously within three to four weeks. A consistent inflammatory response occurred when canine corneas were injured as described. *Beta* ray treatments of 5,000 to 10,000 roentgen equivalent *betas* administered every three to four days immediately after experimental injury caused a delay of a week or more in healing.—[*E. J. Catcott and R. A. Griesemer: A Study of Corneal Healing in the Dog. Am. J. Vet. Res., 15, (April, 1954): 261-265.*]

FOREIGN ABSTRACTS

Antibiotics in Rumenotomies

Fifty-seven rumenotomies were performed in one year and results are compared with those of pre-antibiotic days: 45 are still living, the other 12 were sent to the slaughterhouse. Six of the latter had tuberculosis.

The author credits the systemic use of antibiotics with reducing the mortality. He describes the adverse surroundings under which this operation can now be safely performed. Aseptic precautions must still be employed, however. Sterile silk is used on the rumen and the line of suture is painted with tyrothricin in glyco-alcoholic solution. The muscles and peritoneum are sutured with catgut and sprayed with penicillin and dihydrostreptomycin. The skin is closed with U sutures; no drain is left. Healing is rapid and no abscesses, local peritonitis, or adhesions have been observed.—[*Maurice Baillon: Fifty-Seven Gastrotomies sur les Bovins. Bull. Acad. Vét. de France (April, 1952): 137-140.*]—R.F.V.

A Substitute for Phenothiazine

Technical thiodiphenylamine was used in the treatment of haemonchosis in sheep. The dose for an adult was 15 to 25 Gm. in 10 per cent aqueous suspension. No toxic effects were observed in 150,000 sheep treated. Necropsies showed the drug to be effective. In the U.S.S.R., thiodiphenylamine costs one-third as much as phenothiazine.—[*S. A. Vorontsov: Technical Thiodiphenylamine—A New Anthelmintic in Haemonchosis of Sheep. Veterinariya (Moscow), 30, (Sept., 1953): 30.*]—R.E.H.

Treatment of Salt Poisoning

Salt poisoning in cattle was treated successfully by intravenous administration of 200 cc. of 10 per cent calcium chloride. (In the U.S.S.R., calcium chloride is used in cases where calcium gluconate would be preferred in the U. S.)—[*A. V. Vasin: Treatment of Salt Poisoning of Domestic Animals. Veterinariya (Moscow), 30, (Sept., 1953): 45.*]—R.E.H.

Koagamin in Veterinary Practice

The pharmacodynamics of oxalic and malonic acids (koagamin) on cats, dogs, and horses are studied. A thorough evaluation of blood-clotting time on normal and treated animals is given, and the author reports favorably on the product.

A 1 per cent solution of koagamin is well absorbed when administered either intramuscularly or intravenously. The maximum dose is given as 1 mg. per kilogram of body weight. Signs of toxicity were noted in doses of 30 mg. per kilogram of body weight.—[*T. Frucht: Action de l'acide oxalique et malonique sur la coagulation du sang. (Thesis). Rec. méd. vét. (Feb., 1954):* 128.]—R.F.V.

Fatty Acids in Canine Eczemas

The work of Evans and Burr on young rats deprived of fats in their ration is reviewed. After three months on the delipidated ration, a definite syndrome was evidenced, characterized by lowered basal metabolism, sterility, loss of libido, anovulation in the females, abortions, and skin lesions. The latter are described as hyperkeratotic, parakeratotic, and dermatorrhagic in the caudal region. There is also loss of hair in the dorsolumbar and ventral regions, with an inflammatory edema of the hind legs. The animals lose much weight and become cachectic. These manifestations can be reversed promptly by adding 10 drops of melted lard to the ration daily.

The authors selected animals (cats and dogs)

showing the hyperkeratosis and parakeratosis (eczema) and determined blood plasma levels of nonsaturated fatty acids prior to treatment. Lower levels than normal were found.

Vitamin F (Laroche), used for treatment, was well tolerated by most of the animals. Of 14 cases treated, 6 showed prompt healing; 4 required many weeks before response was noticed; 3 showed very little improvement; and 1 showed no change. On this basis, the author concluded that there was no justification in treating all eczemas with nonsaturated fatty acids.—[*F. Ferrando, J. Euzeby, A. Magot, and R. Gille: Eassais de Traitement des "Eczemas" des Carnivores par les Acides Gras Non Satures (Vitamine F). Bull. Acad. Vét. de France (April, 1952): 157-159.*]—R.F.V.

Stilbestrol in Prostatic Cancer

The authors propose the use of stilbestrol in the treatment of cancer of the prostate gland by embedding a pellet containing 100 mg. of the hormone in each testicle. The administration is performed under local anesthesia. This method supplies sufficient amounts of estrogen to completely atrophy the gland, according to the writers. —[*R. Darget et al.: Le traitement du cancer de la prostate. Presse Méd. (Nov. 22, 1952):1606.*]—R.F.V.

Loose Housing and Milk Production

This article is a comprehensive report on penstabling of dairy cattle. Much of it would be of interest only to dairymen. It is profusely illustrated and surpasses most accounts of this nature which have appeared in American dairy publications. The author goes into every possible phase of this type of housing and compares it with conventional stanchion-stabling. The historical background, economic factors, physiological reactions, hygienic aspects, etc., are considered. From the veterinary standpoint, table 1 may be of interest. There were 17 cows in each group.—[*M. Theret: Loose Housing and Milk Production. Rec. de Med. Vet. (Nov., 1953): 734-765.*]—R.F.V.

TABLE 1—Comparison on Methods of Housing Cattle

Disease condition	Conventional stabling (stanchions)			Loose housing (Pen-stabling)		
	A	B	C	A	B	C
1. Tameness	18	8	2	0	0	0
2. Affection of knees and hocks	8	3	2	0	0	0
3. Wounds of hocks	3	2	2	0	0	0
4. Teat injuries	11	4	6	0	0	0
5. Whitlow	8	3	0	3	0	0
6. Cowpox	3	0	0	3	0	0
7. Acetonemia	4	3	1	3	0	0
8. Metritis	1	0	0	0	0	0
9. Presence of garget in the milk: nonchronic,	9	3	0	10	0	0
chronic	8	3	3	7	1	0
10. Subacute mastitis	1	1	0	4	4	0
11. Acute mastitis	7	7	6	1	0	0
12. Reproductive diseases	3	1	2	1	1	0
13. Indigestion	6	5	0	4	2	1
14. Milk fever	1	1	0	0	0	0
15. Other affections	0	0	0	2	0	0

A = No effect on milk production; B = considerable reduction of milk production during course of illness; C = serious case and permanent effect on animal.

Erysipelothrix Rhusiopathiae Infection in Pigeons

Death by spontaneous *Erysipelothrix rhusiopathiae* infection was established in a female pigeon and her 4-day-old squab. Typical lesions of diamond skin disease in swine were produced with the isolated strain by combined intravenous, intraperitoneal and intracutaneous injection. Pigeons and swine were immunized with the pigeon strain against a challenge infection with an *Ery. rhusiopathiae* strain of swine origin.—[*C. A. Van Dorssen and J. Donker-Voet: On Spontaneous Erysipelothrix Rhusiopathiae Infection in Pigeons. Tijdschr. voor Diergeneesk., 70, (Aug., 1953): 501-513.*]—L.V.E.

Surgical Shock in the Dog

Three groups of influences which are thought to be responsible for the induction of shock during surgical interference are described: (1) the effect on the organism of cold on the peritoneum; (2) the effect of the handling of the intestine; (3) the effect of spaced hemorrhages.

The relationship of the various forms of shock induction to eventual oligemia is discussed in connection with the possibility of therapy by simple fluid replacement.—[*A. M. Harthoorn: On Surgical Shock in the Dog. Tijdschr. voor Diergeneesk., 79, (Jan. 5, 1954): 48-73.*]—L.V.E.

Eclamptic Type of Milk Fever

This article describes "an eclamptic type of milk fever, lactation tetany, or grass tetany of milking cows characterized by two features: sudden appearance, and refractoriness to usual milk fever therapy." The disease is said to appear suddenly, without prodromal symptoms. It is ushered by grinding of the teeth, slight salivation, tetany, incoördination, and rolling of the eyes.

The authors report no response to calcium, magnesium, vitamin A and D, and physiological solutions of glucose. A hypertonic solution of glucose seemed to be effective. It was unfortunate that no blood chemistry of the animals treated was conducted. The diagnosis was made simply on response to hypertonic glucose given intravenously.—[*J. Bruzeau and E. Neveux: Traitement des crises eclamptiques des vaches laiteres. Bull. Acad. Vét. de France (June, 1953): 341-343.*]—R.F.V.

BOOKS AND REPORTS

Review of Experimental Surgery

This is the third edition of this textbook which treats surgery from the physiological standpoint in that it tends to correlate the structure of an organ with its function. Surgical techniques and exercises

are given for the purpose of training the undergraduate and graduate student in human or veterinary surgery. The book represents an attempt to cover the entire field of experimental surgery with small animals as the experimental subject. Some 300 pages, which include many photographs and illustrations, have been added, along with new chapters on surgery of joints, the respiratory system, the kidney (including the artificial kidney), the mechanical heart, and a new chapter on hematology and plasma protein.

As collaborators, Drs. J. Archibald and H. G. Downie, Ontario Veterinary College, increased the value of this book to veterinarians, *i.e.*, the chapters on anesthesia which give a short description of preanesthetic and general anesthetic agents as well as muscle relaxants; on operative techniques on surgical exercises which includes 20 common therapeutic operations besides intramedullary pinning and bone plating; the treatment of cardiac arrest; surgery of the alimentary canal; and hematology and factors governing the restoration of plasma protein.

The book contains some errors such as, "The dog is removed from the cage an hour after the operation and allowed to exercise. This procedure is usually followed by defecation and urination." Undoubtedly, the author means an hour *before* the operation. In the chapter on anesthesia this sentence appears. "The simplest ether receptacle is made from a pound ether can (fig. 2)." On turning to figure 2, we find an illustration of injection into the saphenous vein.

"Experimental Surgery" can be recommended to veterinary students, to veterinarians who do experimental surgery, and to veterinarians who wish to improve their technique and fundamental knowledge of surgery. The therapeutic, as well as some of the experimental, operations described would be of use mainly to the small animal surgeon.—[*Experimental Surgery. By J. Markowitz. 3rd. ed. Cloth. 851 pages. Illustrated. The Williams and Wilkins Co., Baltimore, Md. 1954. No price given.*]—J. P. ARNOLD.

Pulmonary Emphysema of Cattle

Pulmonary emphysema is primarily a disease of adult cattle, which occurs chiefly in late summer and fall when they are transferred from the range to more lush hay, meadow or pasture. Symptoms usually appear in three to ten days with up to one third of the herd being affected. Some die suddenly without symptoms being noticed, others are seen gasping for breath, depressed and, if exercised or excited, die quickly. The temperature may be normal or elevated, subcutaneous emphysema may exist along the back, and urination may be frequent. If undisturbed, the less severe cases may recover in a week to ten days.

Treatment is more apt to be injurious than beneficial although antihistamines, adrenalin, and perhaps mineral oil to absorb possible toxins, may be indicated. Autopsy usually reveals emphysema and edema of the lungs, which sometimes have ruptured, with resulting hemorrhage. The condition is more prevalent in dry years, and seems to be due more to disturbed metabolism than to actual poisoning. There are no indications of infection. The condition can usually be prevented by feeding hay for several days while the cattle are gradually conditioned to the new pasture.—[*Pulmonary Emphysema of Cattle. A publication of the Wyoming Vet. Med. A., Feb. 1, 1954.*]—W.A.A.

Parakeet and Parrot Book

This much needed pamphlet, written chiefly for owners and breeders, is interesting and valuable reading for veterinarians also. It describes several varieties of psittacine birds, their habits, and native diets. Discussed also are their qualifications as pets, their handling, feeding, training, common vices and diseases, from screaming to gout and French moult, common infectious diseases, and parasites. With reference to "favorite medicines" of owners, the author's "best advice for the use of these drugs is 'shake well . . . then throw away'" and consult a practicing veterinarian. There are photographs of 11 disease specimens and three methods of restraint. Advice on methods of examination and hospitalization are included.—[*Angell Memorial Parakeet and Parrot Book. By David L. Coffin, V.M.D. 32 pages. 24 illustrations. Winthrop-Stearns, Inc., New York City. 1953. Price $0.75.*]—W.A.A.

Cesarean Section in the Cow

Of 150 bovine cesarotomies, 89.1 per cent resulted in recovery of the dam and the salvage of 50 per cent of the calves. Indications for the operation included: abnormally large calves (34%), torsion of the uterus (24%), and incomplete dilatation of the cervix (20%). *Beta*-naphthoxyethanol (anavenol K) served as the anesthetic in 110 cases and epidural plus local anesthesia in 30 cases.

With the cow on her right side on an operating table, the incision was made 5 to 10 cm. lateral, and parallel, to the left subcutaneous abdominal vein. The omentum was pushed forward, the gravid horn brought to the incision and incised along the greater curvature, and the calf extracted. No attempt was made to remove the fetal membranes unless the calf was dead or the cervix unopened. The uterus was closed with a No. 4 catgut single, continuous Lembert suture. The omentum was drawn back over the uterus and the abdominal incision closed with eight to 14 Halsted mattress sutures of No. 4 or 5 catgut doubled, placed 2 cm. from the incision, and including all layers, skin to peritoneum. Most cases were hospitalized six to ten days. The membranes were retained in 38 per cent. Some degree of metritis occurred in 50 per cent of the cows but fertility was resumed in 55 to 60 per cent.—[*Caesarian Section in the Bovine. By M. Vandeplassche and F. Paredis, State University, Ghent, Belgium. Paper. 29 pages. 28 figures. Standaard-Boekhandel, Antwerp-Amsterdam. 1953. Price not given.*]—W.A.A.

THE NEWS

Ninety-First Annual Convention – Seattle, August 23-26

Special AVMA Tour Plans Completed

Postconvention Trips to Alaska and Hawaii Offered

An illustrated folder describing the special tours offered in connection with the Seattle meeting was mailed early in May to all members in this country except those in some western states. Any interested member who did not receive a folder may obtain one by writing to the AVMA, 600 S. Michigan Ave., Chicago 5. Some persons not taking the "going tour" to Seattle may want to join one of the "returning tours" or take either the Alaska or Hawaii extension from Seattle.

The printed folder gives complete, detailed information of travel schedules, going and return routes, extensions, costs, and terms. Consequently, only a summary of this information and the highlights will be given here. The tours have been arranged in collaboration with Happiness Tours, the travel agency which handled the highly successful and enjoyable AVMA tours at the time of the San Francisco meeting in 1948, the Miami Beach-Havana combination in 1950, and other special travel for AVMA groups.

Route to Seattle via Glacier National Park

Chicago will be the assembly and starting point for the main party from the East, South, and Central West, which will leave on Wednesday night, August 18. Persons from certain Middlewest and Northwest points will join the tour at St. Paul and a few other principal points along the route.

The going route from Chicago is via the C. B. & Q.-Great Northern streamliner, "Western Star," leaving at 10:50 p.m., Wednesday, August 18, arriving at St. Paul the following morning, and leaving St. Paul after a brief stop.

Highlights of the going trip are a stopover at Glacier National Park Hotel in Montana, motor trips to Medicine Lake, Lake McDonald, over the Continental Divide, and Belton. Leaving Belton on Saturday afternoon, August 21, the tour party will reach Seattle on Sunday morning, August 22.

In Seattle, members of the party will have an opportunity on Sunday to register for the convention either before or after checking in at their hotels. The tour *does not include any activities while in Seattle.* Tour members must make their own hotel reservations there. (Use form in advertising section of this issue if you

(*Continued on page* 486)

General view from Jasper Park Lodge, one of the points of interest included in the itinerary of the group taking tour No. 2, following the annual meeting of the AVMA in Seattle, August 23-26.

—Canadian National Railways

A few of the hotels in Seattle which will house those attending the Ninety-First Annual AVMA Meeting in Seattle, August 23-26.

1—New Camlin Hotel; 2—Ambassador Hotel; 3—New Washington Hotel; 4—Olympic Hotel; 5—Roosevelt Hotel; 6—Hotel Mayflower; 7—Hotel Hungerford.

(*Continued from page* 484)

have not already arranged hotel accommodations through the Housing Bureau.)

Monday, August 23, through Thursday, August 26, are left open for convention activities.

Choice of Return Routes and Extensions

Two choices of return routes from Seattle and two extension tours are offered. (For those taking the going tour to Seattle but who must return directly home after the convenion, arrangements will be made as required.)

Return Route No. 1, via California and the Grand Canyon.—The group will leave Seattle Thursday night, August 26, with stopovers and sightseeing in Portland, Ore., San Francisco, Los Angeles, Hollywood (open time for side trips to Catalina Island, San Diego, Palm Springs, etc.), and the Grand Canyon.

Leaving the Grand Canyon on Thursday, September 2, this tour party will arrive in Kansas City on Saturday morning, September 4, and Chicago that afternoon.

Fares.—Example, leaving from and returning to Chicago—from $312.46 plus $20.65 tax, per person, for two in lower berth, to $417.61 plus $30.18 tax, per person, for two in drawing room. The printed folder will give complete costs on various Pullman accommodations, also fares from a number of points in the United States.

The fares include round-trip, first-class railroad ticket, Pullman accommodations as selected; twin-bed rooms with private bath, basis of two persons in a room; all meals (*table d'hote*) for the entire trip except in San Francisco and Los Angeles; sightseeing and admission fees as authorized in the itinerary; transfers of passenger and baggage; tips for handling baggage; tour manager-escort from Chicago back to Chicago.

Fares do not include hotel accommodations or other features at Seattle during convention; wines, liquors, valet service, laundry, tips to waiters or for other personal services.

Return Route No. 2, via Canadian Rockies and Jasper National Park.—This group will leave Seattle Thursday afternoon, August 26, with stopovers and sightseeing in Vancouver, B.C., the Canadian Rockies, Jasper National Park, motor drives to Mt. Edith Cavell and the Glacier of the Angel.

Leaving Jasper National Park on Monday afternoon, August 30, this tour party will arrive in Winnipeg late Thursday afternoon, August 31, St. Paul on Wednesday morning, September 1, and Chicago on Wednesday afternoon.

Fares.—Example, leaving from and returning to Chicago—from $288.48 plus $17.43 tax, per person, for two in lower berth, to $361.03 plus $24.70 tax, per person, for two in drawing room. The printed folder will give costs on various Pullman accommodations and complete fares from a number of U. S. cities for return route No. 2.

Fares include, for this trip, all features shown for return route No. 1, except there will be no escort from Seattle. However, a tour representative will meet the party on arrival at each stopover point to assist with transfers, baggage, hotel rooms, and sightseeing. Items that fares do not include are the same as for return route No. 1.

Members of tour No. 1 will visit the scenic Grand Canyon on their return from the Seattle convention.

—Santa Fe Railway Photo

Alaska Tour, August 27 to September 6

Leaving Seattle on Friday night, August 27, the travel will be via Canadian Pacific steamship to Victoria and Vancouver, B.C.; transfer at Vancouver to T.S.S. "Prince George" for cruise via the Inside Passage to Skagway; stops made at Prince Rupert, Ketchikan, Juneau, Skagway, Wrangell, and back to Ketchikan and Prince Rupert; cruise of Gardner Canal and Douglas Channel, arriving Ocean Falls on Sunday, September 5; a day in Vancouver, September 6; leaving there by Canadian National Railway that night with arrival in Chicago Thursday afternoon, September 9.

Fare for the Alaska extension: $205.00 plus $20.60 tax, per person. This is in addition to the basic costs to Seattle.

Hawaii Tour, August 26 to September 6

This group will leave Seattle Thursday morning, August 26, via Pan-American Clipper, arriving in Honolulu late that same afternoon. Members will stay at the Royal Hawaiian Hotel. There will be sightseeing on Oahu, flight to Isle of Kauai for a day and night stopover; flight to Isle of Hawaii with stopover; flight to Isle of Hilo with stopover.

This tour will leave Honolulu via Pan-American Clipper on Monday morning, September 6, and arrive in Seattle that night.

Fares.—The cost of the Hawaiian tour is $518.90 plus tax of $38.66, per person, on basis of sharing twin-bed room with bath; or $576.90 plus $40.40 tax for single room with bath.

The fares include round trip tourist class air transportation, Seattle to Honolulu and return; air transportation Honolulu/Kauai/Hawaii and return to Honolulu; transfer of passenger and hand baggage; motor sightseeing; all meals from departure from Seattle until return to Seattle.

The fares do not include personal tips, beverages, valet, laundry, and other personal items.

Interested persons should address inquiries to Happiness Tours, Inc., 6 East Monroe St., Chicago, Ill., who will be glad to supply any information desired.

AVMA members and nonmember veterinarians, their families, and friends may join any of these tours, also representatives of veterinary supply houses which will have exhibits at the Seattle convention.

The July JOURNAL Will Be the Convention Issue

The tentative scientific program for all the sections, the entertainment features which the local committee is planning, and the schedule for various group meetings will be published in the July issue. The scientific and the commercial exhibits will also be listed, along with other pertinent information concerning the seattle meeting.

Meeting of Zoo Veterinarians in Seattle

The annual meeting of zoo veterinarians during the AVMA convention in Seattle is scheduled for Tuesday, August 24, at 4:30 p.m. Anyone wishing to present a case report at this meeting is asked to communicate with Dr. Glen Crosbie, San Diego Zoo, San Diego 12, Calif.

One of the highlights of the Alaska tour, following the close of the AVMA meeting in Seattle, will be mighty Taku Glacier in Alaska.

—Canadian National Railways

News From Washington

Dr. W. L. Boyd, past-president of the AVMA, appeared before the **Subcommittee on Agriculture of the Senate Appropriations Committee** as a representative of the AVMA, on Tuesday, May 4, 1954, to present Association views regarding the need for additional funds to carry on livestock disease prevention and control programs, meat inspection, and expanded research.

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Representatives of the sheep industry, livestock sanitary officials, farm organizations, agricultural press, and the AVMA met with representatives of the Department of Agriculture, Agricultural Research Service, in Washington, May 11, to discuss a **proposed program for the eradication of scrapie.** The fact that scrapie has been diagnosed in six states and that, in some states, it has been impossible to eradicate the infected and exposed flocks emphasizes the need for an effective eradication program supported by all segments of the sheep industry.

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Latest information on the **foot-and-mouth disease situation in Mexico** reveals that one group of test animals placed on cleaned and disinfected premises during the past several months has contracted the disease. Immediate remedial measures were taken, and the premises in question are now again being cleaned and disinfected. The occurrence of this infection among the test animals, while not indicating a general reappearance of the disease in Mexico, is disappointing and will undoubtedly have the effect of modifying the Secretary of Agriculture's announcement of April 14 that Mexico will be declared free of the disease as of Dec. 31, 1954.

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On April 1, 1954, President J. A. McCallam filed a statement with the Committee on Ways and Means of the House of Representatives recommending that **veterinarians be permitted to participate in Social Security** on a **voluntary** rather than a **compulsory** basis. Copies of the complete statement are available upon request from the AVMA office, 600 S. Michigan Ave., Chicago 5, Ill.

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The AVMA **Emergency Advisory Committee** met in Washington May 9, 1954, to consider matters related to military procurement and assignment of veterinary personnel, civil defense, and mobilization of manpower in case of all-out war or attack on this country.

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The U. S. Department of Agriculture has announced that **benzene hexachloride (BHC) and lindane are now acceptable** under U.S.D.A. regulations **for dipping cattle and sheep** in federal-state cooperative scabies eradication programs. This approval of chlorinated hydrocarbon dips, effective April 28, is extended only to the wettable powders and not to their emulsifiable concentrates. In permitting the use of BHC and lindane, U.S.D.A. officials said that experience has proved that these dips, if used properly, provide effective scabies control, but warned that **care must be exercised in** the use of BHC and lindane **to avoid loss of animals by dipping.**

★ ★ ★

Recent changes in alignment of functions within the Agricultural Research Service places the enforcement of **interstate regulation and enforcement of the 28-Hour Law** with the Animal Disease Eradication Branch, and the administration of the **Virus-Serum Toxin Act and the Hog Cholera Serum and Virus Marketing Agreement Act** within the Animal Inspection and Quarantine Branch. Announcement contained in the **Federal Register** indicates these changes became effective May 4, 1954.

Proposed Amendments to Constitution and Administrative By-Laws

Proposals Submitted at 1953 Meeting

The following proposals were submitted at the 1953 annual meeting of the house of representatives, for final action at the 1954 annual meeting.

AMENDMENT NO. 1

Add a new article to the Constitution pertaining to student chapters, as Article VII, and renumber subsequent articles. It would read as follows:

Section 1 — (a) A student organization composed of students in colleges and schools of veterinary medicine approved by the Association's Council on Education may be granted affiliation with the American Veterinary Medical Association upon favorable vote by the Executive Board. The name of such an affiliated organization shall be "The (name of school) Student Chapter of the American Veterinary Medical Association."

b) The qualifications required of a student organization recognized as a student chapter shall be as specified in the by-laws.

[Purpose.—To cover the organization of student chapters formerly provided for in regulations but not incorporated in the Constitution.]

AMENDMENT NO. 2

To provide for the appointment of the treasurer by the Board of Governors as voted by the Executive Board at the annual meeting in 1952, revise Section 1 of Article VI of the By-Laws as follows:

Section 1.—Appointment: The treasurer shall be appointed by the Board of Governors, subject to confirmation by the Executive Board and the House of Representatives, at each regular annual session.

[Purpose.—(1) To give the Executive Board and House of Representatives the authority to appoint the treasurer instead of his being elected by the general membership. This is believed more in keeping with the efficient conduct of the treasurer's duties which practically require the treasurer to reside in the area of the central office. (2) To give closer control of this important office to the Board and House.]

AMENDMENT NO. 3

To amend Section 2 of Article III, Administrative By-Laws, add a new paragraph entitled the "President-Elect" which shall read as follows:

He shall become acting president to fill out the unexpired term in the case of death or total disability or resignation of the president. He shall be duly installed into the office of the president in any of the aforesaid events by the chairman of the Executive Board.

AMENDMENT NO. 4

To amend Section 2 of Article IV, Administrative By-Laws, entitled "Vice-Presidents," delete the second paragraph.

AMENDMENT NO. 5

To amend Section 3 of Article VII, Administrative By-Laws, entitled "Executive Board Chairman," add the following paragraph:

He shall become acting president to fill out the unexpired term in the case of death, total disability, or resignation of the president and president-elect. When he assumes the office of acting president, an election of an acting chairman of the Executive Board shall be conducted by mail ballot of the Executive Board members. Such acting chairman shall serve in this capacity until the next annual meeting of the Executive Board.

[Purpose of amendments 3, 4, and 5.—To insure that the person required to fill out the unexpired term of the principal officer of the Association will have as intimate knowledge as possible of the work of the Association. Under the present system of election and succession, the first vice-president may have had no opportunity to obtain such knowledge.]

AMENDMENT NO. 6

Amend Section 1 of Article VII of the Constitution so that it will read as follows:

The officers charged with duties affecting the entire Association shall consist of a president, a president-elect, five vice-presidents, an executive secretary, a treasurer, and an executive board.

Amend Section 1 of Article I of the Administrative By-Laws so that it will read:

The officers having immediate charge of the Association's affairs in its corporate capacity shall consist of a president, a president-elect, five vice-presidents, an executive secretary, a treasurer, and an executive board. They shall be known as the corporate officers of the Association.

Amend Section 1 of Article IV of the Administrative By-Laws so that it will read:

The five vice-presidents provided for in Section 1, Article VII, of the Constitution shall be elected at each regular annual session immediately following the election of the president-elect and as specified in Section 1, Article III. There shall be one vice-president elected from each of the four convention zones and one shall be elected from the membership at large.

[Purpose.—The purpose of these amendments, all relating to vice-presidents, is to effect the changes so that they will be elected from convention zones and the membership at large instead of being designated as to seniority; also to complete the changes made necessary by amendments No. 3, 4, and 5 above.]

New Proposals

(Based on recommendations of the "Committee on Committees" of the Executive Board and approved by the Board for publication and submis-

sion to the House of Representatives for action at 1954 annual meeting.)

The following amendments are published in accordance with Section 3, Article XIX, of the Administrative By-Laws and will, therefore, be in order for final action at the 1954 session of the House of Representatives.

AMENDMENT No. 7

Amend Section 1 of Article XII, Councils and Committees, so that the last sentence will read:

The selection of personnel for the ensuing year shall be made so that announcement of appointments and the rosters of councils and committees can be made in the October issue of the JOURNAL next following the annual meeting.

Amend Section 2 of Article XII so that it will read:

The president shall be empowered to appoint *other* committees delegated to perform special duties. Their term of office shall be one year. The duties, members, and chairmanship of special committees shall be designated in the announcement of their appointment.

Amend Section 3 of Article XII so that the first sentence will read:

The annual reports of the standing and special committees, with the exception of the Executive Board, the Committee on Budget, *the Committee on Awards,* and the Committee on Resolutions, shall be filed with the executive secretary not later than May first of the current year.

[Purpose.—To put the wording of this Article in conformity with actual practice.]

AMENDMENT No. 8

Amend part 3, Committee on Legislation, of Article XII so that it will read as follows:

a) *Personnel.*—This committee shall consist of seven members, six of whom shall be appointed by the president for three-year terms at the rate of two per year, and the executive secretary or his assistant who shall be the secretary of the committee. The president shall appoint the chairman. The members shall represent federal government service, military service, state livestock sanitary officials, veterinary science departments, schools of veterinary medicine, and practitioners.

b) *Duties.*—It shall be the duty of this committee to study federal legislation referred to it which may affect the profession. It shall recommend actions to be taken by the Association in regard to such legislation. It shall also be the duty of this committee to coöperate with state and local associations on legislative activity whenever possible and whenever requested to do so.

AMENDMENT No. 9

Amend part 4, Committee on Program, of Article XII so that it will read:

a) *Personnel.*—This committee shall consist of the chairmen and secretaries of the regular sections, and the executive secretary *or assistant executive secretary,* who shall act as chairman.

b) *Duty.*—No change in this paragraph.

Delete all of paragraph (c).

Change paragraph (d) to read:

The Committee on Program shall assist in suggesting, obtaining, and selecting scientific and educational exhibits and demonstrations in cooperation with the Committee on Local Arrangements.

AMENDMENT No. 10

Amend part 5, Committee on Public Relations, of Article XII so that it will read:

a) *Personnel.*—The Committee shall consist of six members, three of whom shall be appointed for two-year terms. The president shall designate the chairman.

b) *Duties.*—Its duties shall be that of studying the relations of the veterinary service to other branches of science and industry and carrying out educational programs beneficial to the general welfare of mankind through the medium of the scientific and public press, civic clubs, professional groups, radio, *and television.* The Committee shall counsel with and advise the officers of the Association in regard to the public information and relations program carried on by the Association.

AMENDMENT No. 11

Amend part 6, Committee on Veterinary Biological Products, of Article XII as follows:

Change paragraph (*a*) to read as follows:

a) *Personnel.*—This committee shall consist of six members who shall be appointed for three-year terms, two of whom are to be appointed each year. The president shall designate the chairman. The Committee shall have members from the various fields of veterinary medicine as follows: (1) one associated with the commercial production or marketing of biological products; (2) one an employee of the U. S. Government and associated with the licensing of biological products; (3) one conducting noncommercial research; (4) one a general practitioner; (5) one a state regulatory officer; and (6) one a small animal practitioner.

Add to paragraph (*b*) the following sentence:

This committee shall advise the advertising manager of the JOURNAL relative to the acceptance of advertising pertaining to biological products.

AMENDMENT No. 12

Amend part 7, Committee on Therapeutic Agents and Appliances, of Article XII as follows:

Delete the words "and appliances" from the title.

Change paragraph (*a*) to read as follows:

a) *Personnel.*—This committee shall consist of six members, the majority of whom shall be actively engaged either in teaching or research pertaining to pharmacology or therapeutics, but

one member shall be a general practitioner. The terms of office shall be three years. The president shall appoint members at the rate of two per year and shall designate the chairman. The executive secretary or assistant executive secretary shall be a member *ex officio*.

Delete from paragraph (*b*) the words "of the United States Department of Agriculture and the Federal Trade Commission" and substitute *Federal Department of Health, Education and Welfare*.

Add—This committee shall advise the advertising manager of the JOURNAL relative to the acceptance of advertising pertaining to therapeutic agents.

AMENDMENT No. 13

Amend part 8, Committee on Resolutions, of Article XII as follows:

Substitute the following for existing paragraphs (*a*) and (*b*).

a) *Personnel.*—This committee shall consist of five members appointed by the president for a term of one year. The president shall designate the chairman, and the executive secretary shall be *ex officio* secretary of the committee. He shall receive and submit to the Committee for their recommendations, resolutions presented throughout the year, and report to the Executive Board the action or recommendations of the committee in regard to these resolutions.

b) *Duties.*—To frame, present, and suggest resolutions for the good of the Association, and make recommendations to the Executive Board on resolutions submitted to it by the executive secretary and from members of the Committee.

AMENDMENT No. 14

Amend part 9, Committee on Nutrition, of Article XII as follows:

Change paragraphs (*a*) and (*b*) to read as follows:

a) *Personnel.*—The Committee shall consist of six members, three of whom shall be appointed for two-year terms. The president shall designate the chairman.

b) *Duties.*—It shall be the duty of this committee to submit for publication, in the JOURNAL, abstracts and reviews of articles pertaining to nutrition, and report annually on developments in the science of nutrition significant to veterinary medicine and education. This committee shall, upon request, advise the advertising manager of the JOURNAL concerning the acceptance of advertising of animal and poultry feeds.

AMENDMENT No. 15

Amend part 10, Committee on Poultry, of Article XII as follows:

Change the title to Committee on Poultry *Diseases* and change paragraphs (*a*) and (*b*) to read as follows:

a) *Personnel.*—This committee shall consist of six members, two of whom shall be appointed each year for a term of three years. The president shall designate the chairman.

b) *Duties.*—It shall be the duty of this committee to study the developments in the field of poultry diseases and their control and to report annually any significant findings.

AMENDMENT No. 16

Amend part 11, Committee on Registry of Veterinary Pathology, of Article XII as follows:

Change paragraph (*a*) to read as follows:

a) *Personnel.*—This committee shall consist of six members, two of whom shall be appointed annually by the president for a term of three years. The president shall designate the chairman.

b) Change the words "Army Medical Museum" to read *The Armed Forces Institute of Pathology*.

AMENDMENT No. 17

Amend part 12, Research Council, of Article XII as follows:

Change the words "virus diseases" in line 10, paragraph (*a*) to read *virology*.

AMENDMENT No. 18

Amend part 14, Committee on Parasitology, of Article XII as follows:

Change paragraph (*a*) to read as follows:

a) *Personnel.*—This committee shall consist of six members two of whom shall be appointed each year by the president for a term of three years. The president shall designate the chairman. Insofar as possible, members shall represent various phases of veterinary parasitology and geographical areas of the United States and Canada.

AMENDMENT No. 19

Amend part 15, Committee on History, of Article XII as follows:

Change paragraph (*a*) to read as follows:

a) *Personnel.*—This committee shall consist of six members, two of whom shall be appointed each year for a term of three years. The president shall designate the chairman.

Paragraph (*b*) *"Duties,"* remains unchanged.

AMENDMENT No. 20

Amend Article XIII of the Administrative By-Laws by changing paragraph (*e*), Section 1, to read: (*e*) *Sanitary Science and Public Health.*

[Purpose.—Present title "Public Health" tends to alienate the interest of state and federal regulatory animal disease workers in the Section.]

Change Section 2 to read as follows:

Section 2.—The officers of each section shall consist of a chairman and a secretary.

a) Each section shall elect annually a committee of five members whose duties shall be: (1) nomination of section officers; and (2) coöperation with elected section officers in development of a program for the section.

b) The section officers shall be elected by

each section from the nominees presented by the section committee and/or from the floor.

AMENDMENT No. 21

1) Amend Article IX of the Administrative By-Laws relating to the House of Representatives to include New Brunswick, Canada, in the geographical divisions to be represented through its constituent provincial association.

2) Drop paragraphs (*c*) and (*d*) and include the Army, Air Force, and National Association of Federal Veterinarians (NAFV) in the group of delegates whose four-year terms of office began with the 1953 session of the House.

[Purpose.—To eliminate the terminology of "even-numbered" and "odd-numbered" years which has already been eliminated for other groups.]

Ralston Purina Fellowship Awards for 1954-1955 Announced

The Ralston Purina Company of St. Louis, Mo., has announced the recipients of their research fellowships which were selected in the fields of poultry husbandry, dairy husbandry, animal husbandry, and veterinary medicine by members of Ralston Purina Fellowship Awards Committee. Dr. L. E. Ferguson, chairman of the AVMA Research Council, is a member of the committee.

The award in veterinary medicine was made to Donald P. Waldorf, Lafayette, Ind., for graduate study at the University of Wisconsin.

This is the sixth year in which the Ralston Purina program of fellowships has been in operation.

STUDENT CHAPTER ACTIVITIES

Georgia Chapter.—The following speakers addressed the University of Georgia Student Chapter of the AVMA at meetings during the fall semester of the 1953-1954 school year: **Drs. Paul Burkholder,** Department of Bacteriology, University of Georgia; **John Riddle,** Marietta; **Mr. Neil Manley,** field representative for American Breeders Service; **Drs. W. H. Barner** (M.D.), radiologist from Athens General Hospital; **D. E. Hightower,** West Jefferson, N. Car.; **Richard Sears,** Fair Hill, Md.; **P. Mitchell,** Annapolis, Md.; and **A. M. Mills,** of the College staff.

There was an average attendance of 149 at these meetings. The senior, sophomore, and freshman classes had 100 per cent membership in the Chapter.

The following officers were elected at mid-semester: Lem B. Staton, president; Frank Mitchell, president-elect; Charlie Beard, vice-president; J. O. Shuler, recording secretary; Steve Hite, treasurer; Ed Brown, corresponding secretary; and LeRoy Johnson, representative.

s/ROY R. SMITH, *Retiring President.*

Iowa Chapter.—At the regular monthly meeting on April 14, members of the Iowa State College Student Chapter of the AVMA enjoyed a panel discussion, "Partnerships, Individual Practices, and Employer-Employee Relationships." **Drs. J. W. Sexton** and **E. C. Ritter,** Sumner, and **Dr. E. Hannah,** Springville, discussed the benefits of partnerships; **Drs. William Verploeg,** Pella, and **Frank Lynn,** Sheffield, voiced the merits of individual practice. **Dr. John Herrick,** extension veterinarian, served as moderator.

The annual spring dance of the School of Veterinary Medicine was held at the Ames Country Club on April 30. Marvin Mitchell was chairman of the event.

The spring picnic, sponsored by the Chapter, was held May 20, with Bob Gubser as chairman. The spring smoker will be held June 2. At this time, senior members of the Chapter in good standing will receive their diplomas from Dean Merchant who will also present the wives of seniors with diplomas for their constant encouragement and assistance during the school years. The fall officers will be elected at this meeting.

s/HOWARD E. BAYLES, *Publicity Chairman.*

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Pennsylvania Chapter.—At the Dec. 16, 1953, meeting of the University of Pennsylvania Student Chapter of the AVMA, the following officers were elected: Bernard Levine, president-elect; John Munnell, secretary; and Charles Garvin, treasurer.

The meeting was presided over by incoming president, Hugh Edmonds. Retiring president James Edelbut introduced the speaker of the evening, **Mr. Ralph Kerceval,** manager of Alfred Vanderbilt's Sagamore Farm, the Maryland home of "Native Dancer."

s/JOHN F. MUNNELL, *Secretary.*

WOMEN'S AUXILIARY

Business Agenda for Auxiliary Meeting.—The thirty-seventh annual meeting of the Women's Auxiliary to the AVMA will be held in Seattle, Wash., August 23-26, during the AVMA convention. The Roosevelt Hotel will be Auxiliary headquarters. Entertainment activities will be held elsewhere about the city but all business meetings will be at the Roosevelt.

Probably the first convention activity for most women, after registering, will be attending the opening session of the Ninety-First Annual Meeting of the AVMA on Monday morning, August 23. Tuesday morning, August 24, will be the Auxiliary house of representatives meeting. Mrs. L. R. Richardson, president-elect and chairman of the house, will preside. She has prepared an agenda for that meeting which appears in this column. Only accredited repre-

sentatives have voting power, but all interested women are invited and urged to attend.

Wednesday morning is the annual business meeting. There will be reports from all officers, communications and personal greetings, election of officers, and some brief talks on interesting projects. Here, again, we invite all interested women.

Wednesday afternoon is the meeting of presidents and secretaries of affiliated auxiliaries. This is an informal discussion group. Many excellent suggestions for entertainment and program subjects have been discussed at these meetings. This year for the first time we are planning an exhibit of yearbooks, program leaflets, etc. Mrs. H. S. Atkins, editor of the *AVMA Women's Auxiliary News* will assemble the exhibit. If any of you have interesting material which you would like to share with others, please bring it along or send it to Mrs. Atkins, 918 Lapeer Street, Flint 3, Mich.

At the closing session of the AVMA on Thursday morning, your newly elected officers will be installed. Each year we find more people attending this joint installation service. The service is brief but impressive. Won't you try to attend this year?

There are many social activities planned for your entertainment. There will be the reception and tea, the annual luncheon, the alumni banquets, the president's ball, sightseeing trips, and shopping tours. The local committees have worked very hard to give you a flavor of the Northwest.

Seattle and more in '54.

Agenda of the AVMA Women's Auxiliary House of Representatives

Tuesday, August 24—9 a.m.

Order of Business

Presiding—Mrs. L. R. Richardson.

Call to Order.

Roll Call of Accredited Representatives.

1) Presentation of Minutes, 1953 Session.
2) Opening Remarks—Mrs. Russell A. Runnells.
3) Report of Recorder of the House—Mrs. E. A. Woelffer.
4) Research Being Done Through Grants Made by AVMA Research Fund—Russell G. Rongren, director, Membership Services, AVMA.
5) Women's Auxiliary Column in the AVMA JOURNAL—Helen S. Bayless, assistant editor, AVMA Publications.
6) Unfinished Business
   a) Action on Proposed Amendments to Constitution.
7) New Business.
   a) Report of Executive Board—Mrs. C. M. Rodgers, Secretary.
   b) Items presented by representatives.
   c) Report of Budget Committee—Mrs. C. C. Rife, Treasurer.
   d) Reports of Affiliated Auxiliaries.
   e) Zonal Representation—Mrs. T. J. Hage.
8) Reports of Special Committees.
   Progression of Officers—Mrs. V. H. Miller.
   Regulation for Loan Fund—Mrs. A. E. Coombs.
9) Report of Representative to International Congress—Mrs. S. F. Scheidy.
10) New Committee Appointments.
11) Joint Installation of Officers with AVMA Officers.

Adjournment.

s/LAURA RUNNELLS, *President.*

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Illinois Auxiliary.—The Women's Auxiliary to the Illinois State Veterinary Medical Association held its twelfth annual meeting on February 10-12 at the Morrison Hotel in Chicago, with 145 women in attendance. Honored, out-of-state guests were Mrs. Russell Runnells, president of the national Auxiliary; Mrs. E. A. Woelffer, recorder of the Auxiliary house of representatives; and wives of the convention speakers. Mrs. C. M. Rodgers, Blandinsville, Ill., secretary to the national Auxiliary, was the third AVMA auxiliary officer attending the meeting.

Social activities included a luncheon featuring a pre-Easter showing of spring fashions, and a tea at which Mrs. Ralph Roscher, color stylist of Wheaton, was guest speaker.

During the business session, it was voted to contribute $100 each to the Student Loan Fund and to the Research Fund. The following officers were elected: Mrs. R. L. Poppenhouse, Sterling, president; Mrs. T. M. Wise, Effingham, president-elect; Mrs. R. D. Hatch, Champaign, vice-president; Mrs. W. L. Beer, Aledo, secretary; Mrs. E. C. Hannan, Maple Park, membership secretary; and Mrs. W. J. Gay, Woodstock, treasurer.

The new officers will carry on the radio project and expect to expand still further the use of the AVMA public information radio scripts. At present, 12 stations are using the scripts with several more to start soon. The following comprised the radio project committee for the past year: Mrs. L. A. Hill, Highland; Mrs. C. A. Lemen, Warrensburg; and Mrs. L. J. Miller, Lincoln.

s/(MRS. R. L.) BONNIE POPPENHOUSE, *President.*

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Kansas City Auxiliary.—At the April 20 meeting of the Women's Auxiliary to the Kansas City Veterinary Medical Association, Mrs. Letha M. Strong, director of home services of the Kansas City Power and Light Company, discussed the freezing and preparation of frozen foods.

s/MRS. K. M. CURTS.

No invitation is necessary to become a member of the Women's Auxiliary to the AVMA. We welcome all interested women. The dues are only $1.00 per year. Just write to: Mrs. C. M. Rodgers, Secretary, Blandinsville, Ill.

Seattle Auxiliary.—The Auxiliary to the Seattle Veterinary Medical Association met on February 15 at the home of Dr. Fred Cummings.

Mrs. Floyd Dixon conducted the business meeting at which the following officers were elected: Mrs. Fred Cummings, president; Mrs. William Gustafson, vice-president; Mrs. Joseph Virgin, recording secretary; Mrs. Wallace Flynn, corresponding secretary; and Mrs. Roy Toole, treasurer.

The Auxiliary joined the Veterinary Medical Association for an interesting program in which Dr. Ray Bradbury of Mt. Vernon showed slides and related some of his experiences from his recent trip to Central America.

At the March 15 meeting of the Auxiliary, Mrs. Fred Cummings presided at the business meeting. Mrs. Wallace Flynn entertained with her description and slides of the 1953 AVMA convention at Toronto and vacations taken in Alaska.

APPLICATIONS

Applicants — Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent associations shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative By-Laws.

First Listing

ARDITO, FRANK A.
South Delsea Dr., Nr. Walnut Rd., Vineland, N. J.
V.M.D., University of Pennsylvania, 1940.

FORBES, H. L.
445 London Rd., Sarnia, Ont.
V.S., Ontario Veterinary College, 1916.

GILBERTSON, GORDON
Box 426, Albany, Ind.
D.V.M., Ontario Veterinary College, 1944.

GOOSSEN, IRVIN
Box 146, Emerson, Man.
D.V.M., Ontario Veterinary College, 1944.

MARCOUX, LEONARD F.
Box 90, Morris, Man.
D.V.M., Ste. Hyacinthe Veterinary College, 1950.

O'NEILL, CLIFFORD E.
4613 St. Johns Rd., Vancouver, Wash.
D.V.M., Washington State College, 1949.

Applicants—Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside the jurisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorsers.

First Listing

DAVIS, CHARLES W.
1641 Milford, Houston, Texas.
D.V.M., Texas A. & M. College, 1953.
Vouchers: H. L. Rubin and J. A. Rehkemper.

GILCHRIST, ERNEST W.
192 Calvington Dr., Beverly Hills, Ont.
M.R.C.V.S., Veterinary College of Ireland, 1953.
Vouchers: J. A. Henderson and J. H. Ballantyne.

HUGHES, GEORGE M.
Post Veterinarian, Veterinary Hospital, Camp Stoneman, Calif.
D.V.M., Alabama Polytechnic Institute, 1947.
Vouchers: C. McNellis and N. F. Christensen.

INNES, RUCKER G.
P.O. Box 1372, Modesto, Calif.
D.V.M., Washington State College, 1949.
Vouchers: R. McNellis and C. W. Gollehon.

JORGE, JOAO BRITO
Rua General Glicerio 144, Apto. 204, Laranjeiras, Rio de Janeiro, Brazil.
M.V.D., National College of Veterinary Medicine, 1935.
Vouchers: L. T. Giltner and C. D. Stein.

Second Listing

CAPULONG, TEOFISTO M., 68 P. Burgos St., Batangas, Philippines.

JOHNSON, MILES U., JR., Veterinary Hospital, Ft. Lewis, Wash.

KIM, YONG HAN, Veterinary Division, Bureau of Livestock, M.A. & F., Republic of Korea, Jong-Ro, Korea.

MARCHIANI, WALTER D., Calle 9, No. 7-29, Valera, Venezuela.

1954 Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of student chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

First Listing

Alabama Polytechnic Institute

All of the following applicants, with the exception of those otherwise noted, were vouched for by Drs. R. S. Sugg and W. J. Gibbons.

ALBERT, LUTHER T., D.V.M.
P.O. Box 613, Auburn, Ala.
Vouchers: R. S. Sugg and W. S. Bailey.

Barnhart, Robert E., D.V.M.
1820 28th St., Birmingham, Ala.
Vouchers: R. S. Sugg and W. S. Bailey.

Beall, Robert B., D.V.M.
P.O. Box 411, Pascagoula, Miss.
Vouchers: R. S. Sugg and W. S. Bailey.

Bearden, Norman G., D.V.M.
66 North Reed Ave., Mobile, Ala.
Vouchers: R. S. Sugg and W. S. Bailey.

Bentley, David H., D.V.M.
510 E. Holmes St., Huntsville, Ala.
Vouchers: R. S. Sugg and W. S. Bailey.

Bickley, Sam T., D.V.M.
Rt. 4, Jonesboro, Tenn.
Vouchers: R. S. Sugg and W. S. Bailey.

Bilberry, James D., D.V.M.
2016 E. Madison, Bastrop, La.
Vouchers: R. S. Sugg and W. S. Bailey.

Bozeman, Carl S., D.V.M.
Rt. 3, Jayess, Miss.
Vouchers: R. S. Sugg and W. S. Bailey.

Bryan, William J., D.V.M.
Box 1283, Decatur, Ala.
Vouchers: R. S. Sugg and W. S. Bailey.

Burns, William C., D.V.M.
313 N. Congdon St., Georgetown, S. Car.
Vouchers: R. S. Sugg and W. S. Bailey.

Bush, William D., D.V.M.
Clayton, Ala.
Vouchers: R. S. Sugg and W. S. Bailey.

Canon, William W., D.V.M.
Vaiden, Miss.
Vouchers: R. S. Sugg and W. S. Bailey.

Childers, Henry E., D.V.M.
Rt. 4, Selma, Ala.
Vouchers: R. S. Sugg and W. S. Bailey.

Condra, Alton P., Jr., D.V.M.
Dayton, Tenn.

Cutts, John E., Jr., D.V.M.
101 Hugh Circle, Birmingham, Ala.

Davis, Richard B., D.V.M.
1119 Sixth Ave., Gadsden, Ala.

Donaldson, Roy L., D.V.M.
Rt. 1, Celina, Tenn.

Duke, James H., D.V.M.
Coffee Animal Clinic, LaCenter, Ky.

Dukes, Timon, G., D.V.M.
1412 4th St., Meridian, Miss.

Durr, John L., D.V.M.
Rt. 2, Box 259, Auburn, Ala.

Ebersold, Orin L., D.V.M.
c/o Bel-Aire Animal Hospital, Lakeland, Fla.

Eubank, N. H., D.V.M.
Vanleer, Tenn.

Fitzpatrick, Daniel, D.V.M.
115 N. E. 119th St., Miami, Fla.

Correction.—Dr. Maximo Gamarra R.'s name was incorrectly spelled in his application (March Journal, p. 244). Instead of "Rojas, Maximo G.," it should have been *Gamarra R., Maximo*. Dr. Gamarra's address is Ganadera Dept., Hotel Junin, La Oroya, Peru.

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LUCKEROTH, NORMAN A., D.V.M.
613 N. 10th, Seneca, Kan.

McDONALD, CLIAL D., D.V.M.
127 West Hazel, Garden City, Kan.
Vouchers: J. E. Mosier and L. E. Evans.

MAGRATH, JOSEPH M., D.V.M.
116 West E. St., McCook, Neb.
Vouchers: J. E. Mosier and J. H. Cowan.

MALONEY, CHARLES H., D.V.M.
Afton, Okla.
Vouchers: W. H. Hay and O. J. Eggers, Jr.

MORRISSETTE, MAURICE C., D.V.M.
Clyde, Kan.
Vouchers: J. E. Mosier and J. H. Cowan.

NICKERSON, DONALD L., D.V.M.
403 Adams St., Ottawa, Ill.

Graduating Class, 1954, School of Veterinary Medicine, Michigan State College

Top row (left to right)—James D. Auvil, Peter C. Baldwin, Clifford C. Beck, Jean A. Beckwith, Charles D. Benson, George A. Bergman, Herald H. Boschult, Louis W. Boyer, Eugene H. Brekke, Larry A. Brengle, Joseph R. Calhoon, Jr., Joyce L. Cathey.

Second row—Neal R. Cholvin, Hollis H. Clark, Jr., Dale E. Croxton, George Cruickshank.

Third row—Kenneth N. DeWeerd, Albert Dobias, Raymond H. Elbing, Daniel R. Ellinger, David I. Epstein, Lawrence W. Gearhart.

Fourth row—Allen I. Gleeman, Arthur E. Hall, Homer D. Hanna, Ward V. Herbert, Richard J. Kearns, Richard D. Lindsay, George S. McClarnon, John F. Medlock, Robert W. Medlock, Gerald D. Miedema.

Fifth row—Norman R. Miller, Gerald D. Mitchell, John D. Parker, Robert E. Pearson, Henry J. Peinecke, Donald K. Perry, Donald L. Piermattei, Milton E. Prickett, Patricia A. Prickett, Mark P. Rines, James A. Rooker, Cleland E. Rose.

Bottom row—Thomas J. Skinner, Gerald R. Snyder, John A. Stetson, Paulette Stogis, Robert M. Stone, Richard A. Tjalma, Richard B. Todd, L. C. Vanderwagen, David J. Wakefield, Donald R. Watson, Marlo H. Wirgau, Dean C. F. Clark.

O'DONNELL, FRANK A., D.V.M.
Louisburg, Kan.
Vouchers: M. J. Twiehaus and J. H. Cowan.
ORSBORN, LLOYD E., D.V.M.
R. R. 3, Wamego, Kan.
Vouchers: J. E. Mosier and J. H. Cowan.
PAUL, CHARLES H., D.V.M.
Mayfield, Kan.
PETERSON, JOHN T., D.V.M.
1-C Elliot Court, Manhattan, Kan.
Vouchers: J. E. Mosier and M. J. Twiehaus.
POTTROFF, LLOYD W., D.V.M.
Box 407, Liberal, Kan.
Vouchers: E. Frick and J. H. Cowan.
RUMSEY, REED R., D.V.M.
Soldier, Kan.
Vouchers: J. E. Mosier and E. J. Frick.
SCHNITZLER, F. CHARLES, D.V.M.
2011 S. Hillside St., Wichita, Kan.
SCHRADER, JACK W., D.V.M.
45-A Hilltop Courts, Manhattan, Kan.
Vouchers: J. E. Mosier and J. H. Cowan.
SEATON, VAUGHN A., D.V.M.
Rt. 3, Abilene, Kan.
SHILL, OTTO S., Jr., D.V.M.
47-A Hilltop Courts, Manhattan, Kan.
Vouchers: M. J. Twiehaus and J. H. Cowan.
SHUMAN, DONALD G., D.V.M.
School of Veterinary Medicine, Kansas State College, Manhattan, Kan.
Vouchers: F. H. Oberst and E. J. Frick.
SPAHR, BURRELL D., D.V.M.
19-A Elliot Cts., Manhattan, Kan.
Vouchers: F. H. Oberst and E. J. Frick.
SPROWLS, J. A., D.V.M.
16-A Elliot Courts, Manhattan, Kan.
STRAFUSS, ALBERT C., D.V.M.
Rt. 2, Manhattan, Kan.
SWANN, SORONOA, D.V.M.
239 Park, Merriam, Kan.
Vouchers: W. H. Hay and E. J. Frick.
SWANSON, JOHN J., Jr., D.V.M.
3038 N. 22nd, Kansas City, Kan.
SWENSON, CHARLES B., D.V.M.
Gove, Kan.
Vouchers: O. J. Eggers, Jr., and L. E. Evans.
TODD, ELDON M., D.V.M.
c/o F. W. Thompson, 908 Cleveland, Des Moines, Iowa.
TUTTLE, JOHN N., Jr., D.V.M.
Change Bridge Rd., Montville, N. J.
Vouchers: J. E. Mosier and E. J. Frick.
WAGNER, JOSEPH W., D.V.M.
1512 Webster, Topeka, Kan.
WASSON, GORDON B., D.V.M.
333 Emerson, Bonner Springs, Kan.
WHEATLEY, JOSEPH S., D.V.M.
Idana, Kan.
WOOD, EARL C., D.V.M.
Elmdale, Kan.
Vouchers: J. E. Mosier and J. H. Cowan.
WORTHINGTON, MELVIN L., D.V.M.
30-B Elliot Cts., Manhattan, Kan.
Vouchers: F. H. Oberst and M. J. Twiehaus.

Michigan State College

BECKWITH, JEAN ANN, D.V.M.
7278 Milwaukee Ave., Niles, Ill.
Vouchers: W. O. Brinker and G. H. Conner.

University of Pennsylvania

REICHARD, ROBERT F., V.M.D.
Rt. 1, Macungie, Pa.
Vouchers: D. G. Fridirici and F. M. Iobst.

U. S. GOVERNMENT

Appointments Available in Agricultural Research Service, U.S.D.A.—There are openings in various activities of the ARS and especially in the Meat Inspection Branch and the brucellosis and tuberculosis control and eradication programs of the Animal Disease Eradication Branch of the ARS.

Veterinarians who are graduates of accredited schools of veterinary medicine, or of nonaccredited schools but with five years of veterinary experience since graduation, are eligible for appointments in grade GS-7 at an entrance salary of $4,205 per annum. Those with an additional one year of professional veterinary experience or one year of postgraduate study in the veterinary field are eligible for grade GS-9 at $5,060 per annum.

Noncitizen veterinarians, if graduates of an accredited school and if nationals of countries allied with the United States in current defense efforts, are eligible to temporary (annual) appointments at grade GS-7.

Full-time veterinarians at grade GS-7, upon satisfactory completion of a formal six-month training, may be promoted to grade GS-9, if openings are available. Openings in grades above GS-9 are also becoming available.

Veterinary trainee positions, for students who have completed their junior year, at grade GS-5, $3,410 per annum, will continue to be available each summer.

Indefinite appointments for qualified veterinarians may be available immediately and are effective until the applicant receives his regular rating. Applicants should execute Standard Form 57. For further information see circular letter 413-2, June 20, 1952.

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Bids Open on Plum Island Laboratory.—On April 2, 1954, bids were invited by the U. S. Department of Agriculture on the construction of facilities for the Plum Island Animal Disease Laboratory. Bids filed through the New York District engineer of the Army Corps of Engineers were to be opened on May 20.

The purpose of the laboratory is to study foot-and-mouth disease and other foreign diseases that may create a threat to the livestock industry. Plum Island, near the eastern end of the north fork of Long Island, is owned by the U. S. Department of Defense which is making the laboratory site available to the U. S. De-

partment of Agriculture. Construction of the main laboratory facilities is expected to require eighteen months to complete.

Dr. M. S. Shahan, Agricultural Research Service, is director of the Plum Island Animal Disease Laboratory.

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Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U.S.D.A. Agricultural Research Service are reported as of April 16, 1954:

NEW APPOINTMENTS

Wayne B. Clizer, Portland, Ore.
David W. Johnson, Olympia, Wash.
John E. LeJeune, Baton Rouge, La.
Martin McBride, San Antonio, Texas.
Angus C. Mincey, Jr., Atlanta, Ga.
Harry J. O'Connell, Madison, Wis.
Harry V. Sucher, Los Angeles, Calif.
Joseph A. Wilkinson, Fort Worth, Texas.

MILITARY FURLOUGHS

Fred E. Castro, White Hall, Ill.
Joseph O. Minnick, Kansas City, Kan.
Winthrop C. Ray, Montpelier, Vt.
Robert N. Richardson, Denver, Colo.

RESIGNATIONS

Walter J. Barngrover, Sacramento, Calif.
E. Ralph Laiho, Green Bay, Wis.
Raymond B. Lomax, Waterloo, Iowa.
Julius J. Schoeman, Chicago, Ill.
Morgan Tempero, Ottumwa, Iowa.

RETIREMENTS

Floyd C. Akin, Fort Worth, Texas.
Clifford B. Bratager, South St. Paul, Minn.
Alfred M. Brolling, West Fargo, N. Dak.
Edwin F. Kallenberg, Richmond, Va.
John P. Madden, Portland, Ore.
Cloyd M. Scheloski, Kansas City, Kan.
Clarence A. Schuler, Kinston, N. Car.
Harry J. True, Omaha, Neb.
Joseph A. Wilkinson, Fort Worth, Texas.

TRANSFERS

Maurice S. Batson, from Raleigh, N. Car., to Phoenix Ariz.

Julius H. Czolins, from Waterloo, Iowa, to Fort Dodge, Iowa.

Harold L. Geick, from St. Louis, Mo., to South St. Paul, Minn.

Ollie R. Granthum, from South St. Paul, Minn., to Los Angeles, Calif.

George O. Johnson, from Omaha, Neb., to Berkeley, Calif.

Laurence P. McCain, from Oklahoma City, Okla., to Kinston, N. Car.

George W. Miller, from St. Joseph, Mo., to White Hall, Ill.

Andrew J. Reiher, from Indianapolis, Ind., to Richmond, Va.

TRANSFER CANCELLED

William M. Petersen, from Sacramento, Calif., to Olympia, Wash.

AMONG THE STATES AND PROVINCES

Alabama

Animal Disease Research Workers.—On April 8-9, 1954, the Animal Disease Research Workers in the Southern States held their eighth annual meeting at Duncan Hall Auditorium, Alabama Polytechnic Institute, Auburn. More than 60 members and guests were in attendance. An interesting program of 26 subjects dealing with animal disease research in the southern states was presented.

Officers elected for the coming year were: Drs. R. S. Sugg, Alabama Polytechnic Institute, president; M. W. Emmel, University of Florida, vice-president; P. L. Piercy, University of Georgia, secretary-treasurer; J. C. Osborne, North Carolina State College, and A. L. Kleckner, University of Georgia, directors.

The next annual meeting will be held at the University of Kentucky in Lexington.

s/P. L. PIERCY, *Secretary.*

California

Bay Counties Association.—At the annual business meeting of the Bay Counties Veterinary Medical Association in San Francisco, on Nov. 10, 1953, the following officers were selected for the ensuing year: Drs. Richard L. Stowe, San Francisco, president; David E. Madsen, San Jose, vice-president; and George W. Eberhart, El Cerrito, secretary-treasurer.

s/GEORGE W. EBERHART, *Secretary.*

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Dr. Young Presents Awards to Animal Actors.—Dr. W. A. Young, western regional director for the American Humane Association, presented the fourth annual Patsy awards to the outstanding animal actors of moviedom. First prize for 1953 went to Laddie, a Scotch Collie, for his work in "Hondo." Second place was won by Francis, the talking mule, for his part in "Francis Covers the Big Town." The event is sponsored each year by the American Humane Association.

Connecticut

Death of Professor L. F. Rettger.—Dr. L. F. Rettger, 79, former faculty member of Yale University for forty years, widely known bacteriologist and honorary member of the American Veterinary Medical Association, died in New Haven on Jan. 7, 1954, as the result of carbon monoxide poisoning, which was self-inflicted. He had been in ill health for some time.

Born in 1874 in Indiana where he received his early education, Dr. Rettger received his A.B. and M.S. degrees from the University of Illinois. Later, he entered Yale University as a graduate student and was granted his Ph.D. degree in 1902. He then joined the Department of Bacteriology at Yale, later became its head, and so served until retirement in 1945. He trained hundreds of students and was one of the most widely known men in his field, being especially noted for his work on pullorum disease of poultry which he studied after taking up part-time work at Storrs Experiment Station, University of Connecticut, where he established the Department of Animal Diseases.

His work on pullorum disease led to the development of the blood test control program which became of such great economic importance to the whole poultry industry.

Dr. Rettger also did research work with his colleagues at Storrs on blackhead of turkeys, bovine brucellosis, and other animal diseases. It was these contributions to veterinary science and his real interest in other phases of preventive veterinary medicine which led to his election as an honorary member of the AVMA in 1941. He was a past-president of the American Society of Bacteriologists and organized its Connecticut Valley branch. He was also a member of the American Association for the Advancement of Science, the Sigma Xi, and the A.P.H.A.

Delaware

Dr. Krabill Joins Staff at University of Delaware.—Dr. V. A. Krabill (GA '53) has been appointed assistant professor of poultry pathology at the University of Delaware, College Park.

Since receiving his D.V.M. degree, Dr. Krabill has been on the teaching staff of the Department of Veterinary Pathology, Ohio State University, and has done graduate work there.

s/E. F. WALLER, *Resident Secretary.*

District of Columbia

District Association.—The District of Columbia Veterinary Medical Associaton held their second quarterly meeting at the Army Medical Service Graduate School, Walter Reed Hospital, on March 9. **Dr. L. M. Skamser,** Lederle Laboratories, spoke on modified virus vaccines.

s/WILLIAM C. PATTERSON, *Secretary.*

Florida

Rabies Conference.—The Southeast United States Rabies Conference, held March 19 and 20, 1954, at the Tampa Terrace Hotel in Tampa, was attended by representatives of 20 states and four Caribbean nations. The conference, which had a registration of 110, was sponsored by the Florida State Board of Health, the U. S. Public Health Service, and the Conference of Public Health Veterinarians, under the chairmanship of Dr. James E. Scatterday (OSU '33) of the Florida State Board of Health.

Rabies in bats, one of the principal topics considered, was discussed by **Dr. J. L. Pawan,** Trinidad, B.W.I.; **Mr. C. C. Sanborn,** Chicago Natural History Museum; and **Dr. H. B. Sherman,** University of Florida, Gainesville.

Veterinarians on the program included **Drs. Robert Kissling** and **Ernest S. Tierkel,** Montgomery, Ala.; **James H. Steele,** Atlanta, Ga.; and **P. I. Stenius,** Helsinki, Finland.

Illinois

Northern Association.—The Northern Illinois Veterinary Medical Association held its spring meeting at the Hotel Faust in Rockford on April 21 with Dr. W. L. Derrer presiding and about 150 veterinarians in attendance. The ladies had their luncheon meeting at the Rockford Women's Club.

The program consisted of discussions on "Practical Endocrinology" by **Dr. L. E. Harris,** Norden Laboratories, Lincoln, Neb.; "Canine Geriatrics," **Dr. T. A. Brasmer,** Danville; "The Mashed Teat Problem," **Dr. R. D. Huffman,** Bedford, Pa.; "Hog Cholera Vaccines," **Dr. W. A. Aitken,** Chicago; "Swine Diseases" (illustrated), **Dr. H. C. Smith,** Allied Laboratories, Sioux City, Iowa; and remarks by **Dr. A. K. Merriman,** superintendent, Division of Livestock Industry, Springfield.

It was an excellent meeting with many questions and fine discussions of the various problems. The fall meeting will also be at the Hotel Faust on September 22.

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National Brucellosis Committee.—The annual

Florida Agricultural Experiment Station Veterinary Research Laboratory

The architect's sketch of the main research unit includes poultry and large animal pathology, bacteriology, biochemical and virus laboratories, reception, library, conference rooms, and offices. On either end are covered passages leading to air-conditioned small animal quarters, screened large animal experimental pens, and battery units for investigations of poultry diseases. The parasitology, laboratory, anaplasmosis isolation building, postmortem and incinerator facilities, housed in separate buildings, complete the research group. Thirty acres of pasture plots for experimental animals adjoin the research center.

meeting of the National Brucellosis Committee was held in the LaSalle Hotel, Chicago, on May 13, 1954. The following speakers comprised the scientific program: **Drs. C. D. Van Houweling,** director, Livestock Regulatory Programs, U.S. D.A.; **R. J. Helvig,** assistant chief, Milk and Food Branch, Division of Sanitation, Public Health Service; **Mr. E. G. Huffer,** Milk Sanitarian, Illinois State Department of Public Health; **Mr. W. E. Winn,** president, Pure Milk Association; **Mr. James B. Nance,** secretary, National Hampshire Association; **Mr. Thomas F. Arnold,** American National Cattlemen's Association; **Drs. A. K. Kuttler,** Washington, D. C.; and **J. R. Pickard,** general manager, Livestock Conservation, Inc.

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Chicago Association.—On April 13, the Chicago Veterinary Medical Association met in the Hotel Morrison. The program speakers were **Drs. Jacque Neff,** Hinsdale; **C. B. Hostetler,** Des Plaines; and **Edward C. Khuen,** Evanston.

s/WAYNE H. RISER, *Secretary.*

Indiana

Michiana Association.—The regular monthly meeting of the Michiana Veterinary Medical Association was held at the Hotel LaSalle, South Bend, on March 11. Plans for the bi-annual clinic to be held in May were discussed and committees were named by President Magrane. Following the business meeting, **Dr. R. E. Witter,** University of Illinois, Urbana, presented an informative talk on systemic fungi infections.

At the April 8 meeting, **Dr. W. S. Weisner,** Goshen, president of the state Association, spoke on professional ethics. **Dr. J. J. Fishler** moderated panel discussions on diseases of large and small animals. Other members of the panel on large animals were **Drs. Ray Westcott,** South Bend; **J. Gregg,** Nappanee; and **N. Holm,** La Porte. Members of the small animal panel were **Drs. G. G. Freier,** Benton Harbor, Mich.; **Roy Worley,** South Bend; and **Vic Samshenok,** Niles, Mich.

s/PAUL W. HOUGH, *Secretary.*
s/J. L. KIXMILLER, *Resident Secretary.*

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Michiana Clinic.—The bi-annual clinic of the Michiana Veterinary Medical Association was held in South Bend on May 13. Large and small animal demonstrations were presented alternately. The participants were: **Drs. E. S. Weisner,** Goshen; **R. W. Worley, Bruce Hostrawser, R. W. Westcott, Stanton Williamson,** and **Paul Hough,** South Bend; **H. R. Monfort** and **Harry Magrane,** Mishawaka; **George Freier,** Benton Harbor, Mich.; **N. Holm** and **D. D. Ramsey,** LaPorte; **M. L. Weldy** and **D. Van Meter,** Wakarusa; **Kenneth Fraser,** Niles, Mich.; **H. Holm,** Bourbon; **J. J. Fishler,** Elkhart; **Richard Pliske** and **James Carver,** Michigan City; and **D. L. Miller,** Middlebury.

s/J. L. KIXMILLER, *Resident Secretary.*

• • •

Northwestern Association.—The Northwestern Indiana Veterinary Medical Association met in Rensselaer on March 25. The business session consisted of a round-table discussion on things of interest to the practitioner. The following officers were elected: Drs. R. F. Portman, LaFayette, president; Charles White, Kentland, vice-president; and Leo Cahalan, Logansport, secretary-treasurer.

Georgia Veterinarians Attend Short Course on Medical Aspects of Civil Defense

Approximately 60 veterinarians who live within a radius of 90 miles of Atlanta, Ga., have been attending, since Jan. 18, 1954, bi-weekly civil defense meetings to familiarize themselves with emergency techniques. The last meeting was held on April 5. The instructors are members of the local medical society and are leading specialists in their respective fields of medicine.

The group was entertained by Miss Elizabeth Kresler of Rensselaer who showed slides taken during several summers in Europe. Included in her repertoire were many pictures of the coronation.

s/J. L. KIXMILLER, *Resident Secretary.*

Iowa

Dr. and Mrs. Rugger Featured in Local Paper.—Dr. Fred E. Rugger (ONT '14), of Oxford, and his wife were the subjects of an interesting article in the Cedar Rapids Gazette. Dr. Rugger has practiced in Minnesota and Iowa for forty years, being at Oxford since 1938. Their son, William, will graduate from Iowa State College in June.

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Eastern Iowa Association.—The Eastern Iowa Veterinary Association, Inc., held its twentieth annual practitioners' clinic at the Hawkeye Downs, Cedar Rapids, on May 11. **Dr. Warren E. Bowstead,** of Lowden, served as chairman.

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Dr. Gray Honored.—Dr. Burton J. Gray (ISC '43), of Fort Dodge, was recently honored by the Iowa Junior Chamber of Commerce as "Iowa's Young Man of the Year" for 1953. His civic activities include work with the Y.M.C.A., Kiwanis, Junior and Senior Chambers of Commerce, and church work. Dr. Gray is vice-president of the Fort Dodge Laboratories, Inc.

• • •

Death of Dr. Giffee.—Dr. Joe W. Giffee, Sioux City, Iowa, died on Feb. 25, 1954. He had been in ill health for some time. After receiving his D.V.M. degree from Kansas City Veterinary College in 1912, Dr. Giffee practiced for a while at Liberal, Kan., and then became a meat inspector for the U. S. Bureau of Animal Industry. In this capacity, he worked on hog cholera control in Nebraska, tuberculosis eradication in Mississippi and other southern states and, from 1938 to 1951, on hog cholera control in Cedar Rapids, Iowa. During the past few years, he was employed by the Corn States Serum Company and made his home at Sioux City. Dr. Giffee is survived by his widow, a son, and a daughter.

Massachusetts

State Association.—The regular monthly meeting of the Massachusetts Veterinary Association was held at the Hotel Beaconsfield on April 21. **Dr. James H. Steele,** chief, Veterinary Public Health, Communicable Disease Center, Atlanta, Ga., discussed veterinary aspects of public health.

s/C. LAWRENCE BLAKELY, *Secretary.*

Missouri

Kansas City Association.—At the April 20 meeting of the Kansas City Veterinary Medical Association, in the Livestock Exchange Building, **Dr. H. J. Hill,** in charge of artificial insemination service in Colorado, discussed the practical side of sterility.

s/J. C. DAVIS, *Secretary.*

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Greater St. Louis Association.—The following officers were installed at the March 5 meeting of the Greater St. Louis Veterinary Medical Association: Drs. George L. Murphy, Kirkwood, president; James H. Evans, Jr., St. Charles, vice-president; H. S. Richards, St. Louis, treasurer; and Luther E. Fredrickson, St. Louis, re-elected secretary.

After the business session, **Mr. Clarence Fawcett,** president of the Greater St. Louis Training Club, discussed dog training; and a sound motion picture on dog obedience training, was shown.

s/LUTHER E. FREDRICKSON, *Secretary.*

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Veterinarians Must Renew Licenses.—Under the provisions of the new veterinary practice act, all veterinarians now holding licenses to practice in the State of Missouri and who desire to maintain these licenses in good standing must register for renewal of their licenses with the Missouri Veterinary Board prior to June 30, 1954. Application blanks for license renewal may be obtained from Dr. L. A. Rosner, chairman, Missouri Veterinary Board, P. O. Box 630, Jefferson City, Mo., on request. All licenses not renewed as provided above shall become delinquent, and any veterinarian who shall be delinquent for a period of sixty days shall forfeit his license to practice veterinary medicine in the state.

s/L. A. ROSNER, *Chairman,*
Missouri Veterinary Board.

New Brunswick

Officers of Provincial Association.—At the annual business meeting of the New Brunswick Veterinary Association on February 20 at the Lord Beaverbrook Hotel in Fredericton, the following officers were elected: Drs. G. W. Dashner, St. Stephen, president; D. M. Steeves, Moncton, vice-president; W. A. Roach, Fredericton, secretary-treasurer; and the following councillors: Drs. A. LeBlanc, Moncton; D. Duplessis, Woodstock; A. E. McEwen, Moncton; and M. D. Harlow, Woodstock.

The Women's Auxiliary of the New Brunswick Association also held a meeting on that date.

s/J. F. FRANK, *Resident Secretary.*

New Jersey

Dr. Kaschula Appointed Research Specialist at Rutgers University.—Dr. Victor R. Kaschula, East London, South Africa, will be associated with Dr. F. R. Beaudette, poultry pathologist, at the New Jersey Experiment Station, Rutgers University, in research on diseases, parasites,

nutritional disturbances, and breeding difficulties of horses.

After receiving his bachelor's degree in veterinary science at the University of Pretoria in 1941, Dr. Kaschula conducted research in animal diseases for the South African Government. Thoroughly conversant with horses, Dr. Kaschula has done extensive work on virus and other diseases of these and other large animals, as well as poultry.

In 1949, Dr. Kaschula spent nine months visiting pathology laboratories and experiment stations in the United States. At that time, he paid an extended visit to Dr. Beaudette at the New Jersey Experiment Station and was invited to join the staff.

New York

New York City Association.—The regular meeting of the Veterinary Medical Association of New York City, Inc., was held the evening of April 7 at the New York Academy of Sciences. The guest speakers were **Drs. Edward B. D. Newhauser** (M.D.), radiologist, the Children's Medical Center, Boston, who discussed roentgen examination of the soft tissues as an aid in diagnosis; and **Dr. George H. Ludins,** Hartford, Conn., who spoke on the Hartford veterinary service plans.

s/C. E. DECAMP, *Secretary.*

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Death of Dr. H. J. Milks.—Dr. Howard J. Milks, 74, emeritus professor of veterinary therapeutics and small animal diseases at New York State Veterinary College, died on March 30, 1954. Born at Candor, N. Y., Dr. Milks received his early education in the public schools and his D.V.M. degree from Cornell University in 1904. He was known to veterinarians all over the world and was the author of "Practical Veterinary Pharmacology, Materia Medica, and Therapeutics," a book which was widely used in veterinary schools and by veterinarians.

Dr. H. J. Milks

In 1942, Dr. Milks was honored by his alma mater and former students through presentation of his portrait to the School.

Dr. Milks joined the AVMA in 1904 and held membership continuously since that time; he was made a life member in 1953. He served the Association in a number of capacities over the years including terms on the Committee on Proprietary Pharmaceuticals.

Ohio

Conference for Veterinarians.—The twenty-third annual conference for Ohio veterinarians was held April 14-15, 1954, at the College of Veterinary Medicine, Ohio State University, Columbus.

The following guest speakers appeared on the program: **Drs. James Archibald,** Ontario Veterinary College, Guelph; **C. W. Cromley,** Asheville; **G. T. Edds,** Fort Dodge Laboratories, Fort Dodge; **Mr. M. E. Glasser,** Professional Oxygen Service, Miami, Fla.; **Drs. Franklin Gruesser,** Akron; **J. R. Hay,** chief, Division of Animal Industry, Ohio Department of Agriculture, Columbus; **J. C. Kile,** Oak Ridge Laboratories, Oak Ridge, Tenn.; **N. B. King,** Ohio Agricultural Experiment Station, Wooster; **J. O. Knowles,** Miami, Fla.; **R. L. Knudson,** U.S.D.A. Agricultural Research Service, Columbus; **A. W. Krause,** Cherokee, Iowa; **Mr. D. V. Philleo,** General Electric Co., Milwaukee, Wis.; **Drs. A. H. Quin,** Kansas City, Mo., president-elect of the AVMA; and **T. Y. Tanabe,** Ph.D., Pennsylvania State College, State College, Pa.

Members of the faculty of the Ohio State University College of Veterinary Medicine who participated in the program were: **Drs. H. E. Amstutz, E. J. Catcott, C. R. Cole, C. D. Diesem, R. L. Farrell, H. A. Gorman, R. A. Greisemer, R. A. Grimshaw, H. F. Groves, J. H. Helwig, D. O. Jones, F. J. Kingma, F. R. Koutz, W. R. Krill, G. A. Marsh, T. E. Powers, R. E. Rebrassier, C. F. Reed, R. L. Rudy, V. L. Sanger, C. R. Smith, V. L. Tharp,** and **J. L. Thorne.**

s/R. E. REBRASSIER, *Secretary.*

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Killbuck Valley Association.—The Killbuck Valley Veterinary Medical Association met on March 5, 1954, at the Ohio Hotel in Wooster. The following committees were appointed: public relations, membership, project, program, committee on ethics, fees, and credit references.

s/HAROLD F. GROVES, *Resident Secretary.*

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Northwestern Association.—The forty-seventh annual winter meeting of the Northwestern Ohio Veterinary Medical Association was held March 31, 1954, at the Hillcrest Hotel in Toledo.

The following speakers participated in the program: **Drs. R. L. Mowry,** School of Veteri-

nary Medicine, Michigan State College, East Lansing; **R. E. Brown,** Lansing, Mich.; **L. T. Dawe,** Capac, Mich.; **D. E. Mossbarger,** Bloomingburg; and **J. R. Peters,** Archbold.

s/COSTAS S. ALVANOS, *Secretary.*

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North Central Association.—The North Central Ohio Veterinary Medical Association recently elected the following officers: Drs. Robert Knappenberger, Bucyrus, president; Robert McClung, Tiffin, vice-president; and B. W. Kagy, Tiffin, secretary-treasurer. The meeting was at Richwood, Ohio.

Dr. Harry Geyer, Columbus, discussed the present practice act and the possibilities of revision.

s/HAROLD F. GROVES, *Resident Secretary.*

Oklahoma

Conference for Veterinarians.—The annual conference for Oklahoma veterinarians was held at Stillwater, on May 2-4, 1954. Closed-circuit television, which proved a convenient and enjoyable medium last year, was used again this year for surgical, clinical, radiological, and laboratory demonstrations. Among the guest speakers scheduled to participate in the conference were: **Drs. R. J. Beamer,** Texas A. & M. College, School of Veterinary Medicine; **Carl E. E. Bunn,** Sharpe and Dohme, Philadelphia, Pa.; **B. M. Carnes,** Muskogee; **C. N. Cooper,** Jensen-Salsbery Laboratories, Kansas City, Mo.; **E. F. Ebert,** School of Veterinary Medicine, University of Missouri, Columbia; **Lucille K. Georg,** Communicable Disease Center, Chamblee, Ga.; **R. H. Leonard,** Muskogee; and **P. E. Russo,** Department of Radiology, Oklahoma University School of Medicine.

The following staff members of the Oklahoma A. & M. College also participated in the program: **Drs. E. L. Blevins, A. E. Darlow, B. L. Blenn, W. H. Krull, A. L. Malle, L. E. McDonald, L. H. Moe, C. N. Murphy, W. M. Rice, C. K. Whitehair,** and **J. W. Wolfe.**

s/J. D. FRIEND, *Chairman.*

Ontario

Dr. MacNabb Memorial.—Members of the staff and friends of the Ontario Veterinary College participated in an impressive ceremony at War Memorial Hall on the campus of the Ontario Agricultural College, Guelph, on Feb. 24, 1954. The occasion was the unveiling of a bronze of the late Principal Andrew Leslie MacNabb and the dedication and opening of the MacNabb Memorial Library. Dr. T. Lloyd Jones, present principal of the College, acted as chairman.

Following opening remarks by Mr. C. D. Graham, deputy minister of agriculture for Ontario, the bronze bust was unveiled by Mrs. A. L. MacNabb, widow of the late principal. A eulogy was delivered by Col. Thomas L. Kennedy, former premier of Ontario and minister of agriculture for the province during Dr. McNabb's tenure of office.

Bronze plaques in memory of past principals of the College were presented during the afternoon and formally accepted by Principal Jones. Those honored and the respective donors of the plaques were: Andrew Smith, founder and first principal (1862 to 1908)—Ontario Veterinary College Alumni; Edward A. A. Grange (1908 to 1918)— an anonymous donor; Charles Duncan McGilvray (1918 to 1945)—class of 1941, represented by Dr. D. A. Barnum; and Andrew Leslie MacNabb (1945 to 1952)—American Board of Veterinary Public Health, represented by Dr. H. J. Stafseth, Michigan State College. Prayers of dedication were said by Padre W. A. Young, college chaplain.

Major participants in the unveiling of the bronze of Dr. A. L. MacNabb were (left to right)—Mrs. A. L. MacNabb; Col. Thomas L. Kennedy; Miss Margaret MacNabb, daughter of the late principal; and Dr. T. Lloyd Jones.

A reception was then held at the Veterinary College, presenting an opportunity to see the new library which comprises offices and a reading room.

Pennsylvania

Keystone Association Honors Dr. W. J. Lentz.—A special meeting of the Keystone Veterinary Medical Association was held on Wednesday, February 24, to honor a member widely known in the veterinary profession, Dr. William J. Lentz (UP '04), for many years professor of anatomy and director of the small animal clinic at the School of Veterinary Medicine, and now retired. The meeting was known as "William J. Lentz Night" and was attended by a large number of his friends, colleagues, and former students.

Dr. Lentz served as house surgeon at the hospital of the veterinary school for five years following graduation. In 1906-1907, he enrolled as a third-year medical student at Hahnemann

Medical College. He was appointed assistant demonstrator of anatomy at the veterinary school in 1907, demonstrator of surgery in 1908, demonstrator of anatomy in 1909, professor of veterinary surgery in 1910 and, in 1912, to the position above mentioned. During World War I, Dr. Lentz served as acting dean of the veterinary school. He was one of the stalwarts on the faculty who saw the school through the difficult postwar days, never losing faith in veterinary medicine as a career nor in the ability of the School to weather the times and continue its contributions to veterinary education.

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Bucks-Montgomery Association.—On April 14, the Bucks-Montgomery Veterinary Medical Association met at the Moose Home in Doylestown. Dr. C. J. Hollister, president of the Pennsylvania Veterinary Medical Association addressed the group.

s/V. W. RUTH, *Secretary*

Washington

Conference for Veterinarians.—The College of Veterinary Medicine, State College of Washington, presented its sixth annual conference for veterinarians on April 8-10, 1954. A total of 150 veterinarians attended, coming from eight states and two Canadian provinces.

The opening meeting consisted of presentations of research reports from the veterinary staff. The remainder of the program was comprised of guest speakers which included **Drs. R. L. Burkhart,** director of veterinary clinical research, Lederle Laboratories, Pearl River, N. Y.; **Leo. K. Bustad,** General Electric Company, Richland; **G. W. Eberhart,** small animal practitioner, El Cerrito, Calif.; **E. R. Frank,** head, Department of Veterinary Surgery, Kansas State College, School of Veterinary Medicine, Manhattan; **W. J. Hadlow,** pathologist, Rocky Mountain Laboratory, Hamilton, Mont.; **P. G. MacKintosh,** Yakima, vice-president, AVMA; **Blaine McGowan,** Department of Clinics, College of Veterinary Medicine, University of California, Davis; **Lee Seghetti,** associate pathologist, Agricultural Experiment Station, Bozeman, Mont.; and **A. O. Shaw,** chairman, Department of Dairy Science, State College of Washington.

s/R. E. WATTS, *Conference Chairman.*

Three of the guest speakers at the sixth annual conference for veterinarians at Washington State College. Left to right—Drs. Lee Seghetti, Leo K. Bustad, and Blaine McGowan.

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Seattle Association.—The Seattle Veterinary Medical Association met at the home of Dr. Fred Cummings on February 15. Officers elected for the year were: Dr. Floyd K. Dixon, president; Dr. T. J. Guilfoil, vice-president; Dr. Joseph O. Virgin, secretary; Dr. G. W. McNutt, treasurer; and Drs. O. A. Anderson, Don W. Clarke, Fred Cummings, Chet R. Griffith, and James Kraft, trustees.

An interesting program was presented by **Dr. Ray H. Bradbury** of Mount Vernon who showed slides and related some of his experiences of his recent trip to Central America.

At the March 15 meeting, **Dr. Floyd Dixon** conducted the business meeting. **Dr. Jay H. Miller** spoke on the practitioner and the veterinary public health organization.

Wisconsin

Officers of Milwaukee Association.—The following officers have been elected to serve the Milwaukee Veterinary Medical Association for 1954: Drs. K. G. Nicholson, president; G. Downing, vice-president; and G. F. Lynch, secretary-treasurer.

s/G. F. LYNCH, *Secretary.*

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Dr. and Mrs. Buchholz Featured in Newsgram.—Dr. and Mrs. Harvey H. Buchholz, of Wilton, were featured in an article in the *Motorola Newsgram,* February, 1954. They were the first to use a two-way radio system in Wisconsin. Their 60-watt transmitter gives a coverage as far as 40 miles. The article states that more than 500 veterinarians have secured Federal Communications Commission's licenses for two-way radios in recent years.

FOREIGN NEWS

Africa

First Pan-African Days for Zootechnology to Be Held in Algiers.—The Veterinary Society for Zootechnology of Algiers has announced, through its general secretary, the organization of the program of the First Pan-African Days for Zootechnology, to be held in Algiers, Oct.

17-23, 1954. Program topics to be presented by various reporters include: "Artificial Insemination" by Dr. Anderson of Navasha, Kenya; "Contagious Pleuropneumonia" by Dr. Silva Nunez Araujo, New Lisbon, Angola, Spain; "Trypanosomiasis" (reporter not designated); "Utilization of Food Resources of the African Continent" by Dr. Receveur, Fort Lamy-Tchad, A. E. F.; "Rinderpest" by Dr. Mornet, Dakar-Senegal, A. O. F.; "Bovine Piroplasmosis" by Dr. Donatien, Algiers; and "Mineral Deficiencies" by an undesignated reporter from the Union of South Africa.

Further information can be obtained by writing to Dr. R. Camou, general secretary of the Societe Veterinaire de Zootechnie D'Algerie, 3 Rue Péllissier, Algiers, Algeria.

Brazil

Dr. Jorge Visits AVMA Office.—Dr. Joao Brito Jorge, a veterinarian from Brazil, who also is a journalist, visited the AVMA office recently. He is attending classes at the College of Veterinary Medicine, University of Illinois.

Philippine Islands

Dr. Solis in the United States.—Dr. Jose A. Solis, associate professor and acting head of the Department of Veterinary Anatomy, College of Veterinary Medicine, University of the

VETERINARY MILITARY SERVICE

The eighty-fourth class of veterinary officers who have completed (March 20, 1954,) the course at the Army Medical Service Meat and Dairy Hygiene School in Chicago. During the past two years, each class has visited AVMA headquarters to inspect the central office facilities and hear talks on the work of the Association.

Front row (left to right)—First Lt. John A. Postle, adjutant; Capt. Elmer L. Robinson, instructor; Capt. William R. Strieber, instructor; Major Thomas A. S. Hays, instructor; Lt. Col. Harry R. Lancaster, commandant; Lt. Col. George D. Batcheldor, director; Capt. John S. Zwiers, instructor; Major George F. Dixon, instructor. Second row—Second Lt. Richard J. Buckman; Second Lt. Kenneth J. Wales; First Lt. Robert L. Schricker; Second Lt. Dallas L. Nelson; Second Lt. Sterling E. Rood; First Lt. Clarence E. Jones; Capt. Martin Kagan; Second Lt. Bert O. White; Second Lt. Charles O. Gardner; Major Glenn A. Washburn, instructor.

Third row—Second Lt. Robert R. Porter; Capt. Warren J. Shay; Capt. Sidney Feinberg; Capt. James F. Morrow; Second Lt. Thomas J. O'Brien; First Lt. Allison D. Reed; Second Lt. Howard S. Wilcox; First Lt. Peter L. Malnati, Jr.; First Lt. Parmenion A. Halakatevakis.

Back row—First Lt. John D. Galbreaith; Second Lt. Arthur D. Newell; Capt. James R. Clanton; First Lt. David C. Berglund; Second Lt. Lawrence W. Goodman; Major Norman J. Glucksman; Second Lt. Duane C. Peterson; Capt. Jack G. Ballentine; Capt. Ernest K. Stonebraker.

Philippines, left for the United States on Dec. 26, 1953. After studying at Iowa State College, under the Foreign Operations Administration Scholarship Trainee Program, Dr. Solis will visit other colleges and laboratories prior to his return to the Philippines.

S/JOSE B. ARANEZ,
Foreign Corresponding Secretary.

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Dedication of New Veterinary Medical Building.—The new building of the College of Veterinary Medicine, University of the Philippines, Diliman, Quezon City, which was designed to accommodate 250 students, was dedicated on March 12, 1954. The University of the Philippines was aided in the construction of this building by the joint assistance of the Philippine Council on United States Aid and the Foreign Operations Administration. Additional personnel, new books, laboratory equipment, instruments, and audio-visual apparatus were also provided. The present enrollment of the college is 183, the largest enrollment in the history of the college.

The new building of the College of Veterinary Medicine, University of the Philippines, Quezon City.

Dedication of the new building of the College of Veterinary Medicine.

Dr. Angel K. Gomez, dean of the College, delivers an address at the dedication ceremonies. Seated (left to right) on the platform behind him are: Dr. Manual D. Sumulong, director of the BAI; Mr. Edward Prentice, deputy director, U. S. Foreign Operations Mission, Foreign Operations Administration; Dean Leland Call, agricultural research advisor, U. S. Foreign Operations Mission; and Dr. Jose B. Uichanco, secretary of the College.

S/JOSE B. ARANEZ,
Foreign Corresponding Secretary.

Trinidad

Dr. Pawan Honored.—The American Board of Veterinary Public Health conferred an honorary fellowship upon Dr. J. L. Pawan, of Trinidad of the British West Indies, during the recent meeting of the Southeast United States Rabies Conference in Tampa, Fla. He was honored for his outstanding research in vampire bat rabies. Dr. Pawan, who received his medical degree from the University of Edinburgh in 1912, later studied public health and tropical medicine at London, Hamburg, Paris, and Vienna.

STATE BOARD EXAMINATIONS

Missouri—The annual meeting of the Missouri Veterinary Examining Board will be held at Columbia, Mo., on June 7-8, 1954. Any persons interested in taking the examination for license to practice veterinary medicine in Missouri may obtain application blanks from Dr. L. A. Rosner, chairman, Missouri Veterinary Board, P.O. Box 630, Jefferson City, Mo. The examination fee is $25, which includes the annual registration fee for one year.

New York—The New York State Board of Veterinary Medical Examiners will hold examinations June 29 to July 2 and September 21 to 24, 1954, in New York City, Albany, Syracuse, and Buffalo. The practical examination will be held at Ithaca on July 8. No date has yet been set for the fall practical examination. James O. Hoyle, 23 South Pearl Street, Albany 7, N. Y., secretary.

BIRTHS

Lieutenant Arthur E. Maude (ONT '52) and Mrs. Maude, Brooklyn, N. Y., announce the birth of a daughter, Karen Elaine, on March 30, 1954.

Dr. (MSC '49) and Mrs. Sheldon Padwee, Bloomfield, N. J., announce the birth of a daughter, Shawn Florene, on April 6, 1954.

Major George M. Grimes (TEX '43) and Mrs. Grimes, The Hague, Holland, announce the birth of a son, George Avery, on April 8, 1954.

Dr. (OSU '50) and Mrs. D. A. Price, Sonora, Texas, announce the birth of a daughter, Donna Jean, on April 27, 1954.

Lieutenant Winthrop Ray (MSC '53) and Mrs. Ray, Dodge, Mass., announce the birth of a son, James Curtis, on April 30, 1954.

DEATHS

Albert L. Brainard (OSU '16), 65, Cleveland, Ohio, died Nov. 21, 1953. Dr. Brainard, who retired in 1952, was the founder of one of the first pet cemeteries in the country.

Alex H. Brown (ONT '91), 88, Pipestone, Minn., died Jan. 26, 1954. After receiving his D.V.M. degree, Dr. Brown attended Jefferson Medical College in Philadelphia and was awarded his M.D. degree in 1895. He is survived by a daughter and a stepdaughter.

Wilbur L. Brown (COL '17), 70, Fresno, Calif., died late in December, 1953. Dr. Brown, who was for more than twenty years Fresno County livestock inspector, was a member of the California State and Central California Veterinary Medical Associations and had been a member of the AVMA. He is survived by his widow, a daughter, and two granddaughters.

John L. Bullock (KCV '11), 76, Durham, N. Car., died Nov. 18, 1953. Dr. Bullock had practiced at Creedmore, Oxford, and Durham, N. Car., since 1926. At the time of his death, he was the oldest practitioner in the state.

William G. Chrisman (ONT '02), 75, Chapel Hill, N. Car., died Jan. 11, 1954. Dr. Chrisman served as state veterinarian of North Carolina from 1909 to 1913; as professor of veterinary science at Virginia Polytechnic Institute from 1913 to 1923; veterinarian of the health department at Danville, Va., from 1924 to 1928; chief field veterinarian, Maryland Department of Agriculture, from 1929 to 1935; and veterinarian for the health department of Orange County, North Carolina, from 1935 until his death. He had been a member of the AVMA.

Jacob A. Cook (CVC '09), 79, North Manchester, Ind., died Feb. 4, 1954. Dr. Cook was a general practitioner. He was a member of the Wabash Valley and Indiana State Veterinary Medical Associations and had been a member of the AVMA.

★**Charles E. Cotton** (UP '93), 82, Minneapolis, Minn., former state veterinarian, president of the AVMA (1916-1917), and Honor Roll member since 1948, died on April 21, 1954. A more extended obituary will appear in the July JOURNAL.

Raymond E. Cropper (MCK '16), 64, Winchester, Ky., died Dec. 16, 1953. Dr. Cropper had retired from practice in 1947. He had been a member of the AVMA.

Robert Darling (MON '88), San Diego, Calif., died April 27, 1953. Dr. Darling is survived by his widow.

Harry E. Davis (MCK '14), 73, San Ysidro, Calif., died Jan. 11, 1954. Dr. Davis, who had specialized in equine practice and research in South Dakota, had made his home in California since his retirement.

J. C. Flynn (KCV '10), 76, Kansas City, Mo., died April 26, 1954. Dr. Flynn was a past-president of the AVMA, having served in this capacity in 1935-1936. An obituary will appear in the July JOURNAL.

★**Joe W. Giffee** (KCV '12), 65, Sioux City, Iowa, died Feb. 25, 1954. An obituary appears on page 505 of this JOURNAL. Dr. Giffee was a member of the AVMA.

C. H. Hamilton (MSC '52), 29, Germantown, Wis., died on March 5, 1954, as the result of an automobile accident. Dr. Hamilton had conducted a large animal pratice in Germantown since his graduation.

George H. Hill (CVC '11), Geneseo, Ill., died Sept. 12, 1953, after a heart attack. Dr. Hill, was a general practitioner.

Arthur L. Johnson (IND '10), 68, New Harmony, Ind., died Jan. 26, 1954. Dr. Johnson was a general practitioner.

Louis L. Jones (KCV '06), 74, Garden City, Kan., died Feb. 1, 1954, of a heart attack. Dr. Jones, who combined ranching with the practice of veterinary medicine, was also active in civic affairs having been a member of the local school board, the Kansas Livestock Sanitary Commission, Kansas Farm Labor Board, trustee and vice-president of the Garden City National Bank, and an active member of the Kansas Veterinary Medical Association. Dr. Jones is survived by a son, two daughters, and his widow.

★**William C. Kortenber** (GR '10), 68, New Haven, Ind., died April 5, 1954. Dr. Kortenber, a small animal practitioner, was admitted to the AVMA in 1920.

Frank W. Larson (ISC '09), 67, Tucson, Ariz., died Nov. 15, 1953. Dr. Larson had retired from practice.

Garfield McClaughry (KCV '10), 73, Mound City, Kan., died Oct. 8, 1953. Dr. McClaughry, an expert horseman and lover of all animals, had the misfortune of suffering from ill health almost from the beginning of his career. While serving in the Army in 1897, he contracted typhoid fever, which impaired his health, and shortly thereafter he was stricken with exophthalmic goiter from which he never recovered. He had been inactive since 1949 when he had coronary thrombosis. Dr. McClaughry is survived by one son, Larry E. (KSC '45) of Omaha, Neb.

C. R. McElwain (KCV '18), 64, Colorado Springs, Colo., died Dec. 3, 1953. Dr. McElwain had served in the Veterinary Corps of the U. S. Army during World War I. He was a general practitioner.

Ray A. McFarland (MCK '13), 70, Monrovia, Calif., died Jan. 24, 1954. Dr. McFarland retired from the federal meat inspection service in 1946. He is survived by his widow, two daugh-

★Indicates members of the AVMA.

ters, and two sons, Robert J. (WSC '39), of San Diego, Calif., and Ray W. (WSC '39) of Santa Cruz, Calif.

Wm. E. Madson (ISC '05), 74, Hawarden, Iowa, died Jan. 24, 1954. Dr. Madson served as an inspector for the U. S. Bureau of Animal Industry at Cedar Rapids for several years, and later was a member of the faculty of the School of Veterinary Medicine, Iowa State College.

Esmond E. Patterson (IND '15), Indianapolis, Ind., died Feb. 21, 1954. Dr. Patterson was a general practitioner.

★**Martin W. Rosengren** (KCV '09), 77, Ackley, Iowa, died Feb. 7, 1954. Dr. Rosengren, a general practitioner, was admitted to the AVMA in 1930. He is survived by his widow.

★**Luis Santa Maria** (MEX '17), 55, Mexico, D. F., Mex., died in April, 1951. Dr. Santa Maria was foreign resident secretary for the AVMA from 1921 until his death. He was admitted to the AVMA in 1921.

★**Robert H. Schrecengost** (MCK '14), 62, Arcadia, Calif., died March 20, 1954. Dr. Schrecengost was a member of the Los Angeles County Livestock Department from 1934 until his retirement in 1947. He was also a member of the California State and Southern California Veterinary Medical Associations and of the AVMA. He is survived by his widow and a son.

Charles F. Sheets (IND '15), 66, Delphi, Ind., died Jan. 3, 1954. Dr. Sheets, a general practitioner, was for many years a member of the AVMA. He had retired from practice.

Henry Singleton (KCV '06), 83, Houston, Texas, died on Dec. 5, 1953, after a long illness. Dr. Singleton entered the Bureau of Animal Industry after his graduation and served as a meat inspector in Fort Worth and Houston, Texas, and Montgomery, Ala. He retired from the BAI in 1933, but continued to do meat inspection work, first in St. Louis, Mo., and later in Houston, Texas. Ill health forced his retirement in 1948, and he dropped his AVMA membership in 1949. Dr. Singleton is survived by his widow, one daughter, one son, six grandchildren, and four great-grandchildren.

★**Corwin L. Smith** (ISC '41), 39, Sycamore, Ill., died Aug. 30, 1953. Dr. Smith was a member of the Illinois Veterinary Medical Association and of the AVMA. He is survived by his widow.

Henry C. Stetson (ONT '11), St. Johnsbury, Vt., died Feb. 11, 1954. Dr. Stetson, who had been a general practitioner since 1913, was a successful veterinarian, a good husbandman, and a highly respected citizen. One of his sons, Harvey B. (UP '45), practices in Lyndon Center, Vt., and the other son is a senior at the University of Pennsylvania.

★**Ronald H. Swayze** (OKL '53), 24, Tulsa, Okla., was killed in the crash of his private plane on March 24, 1954. Dr. Swayze was a general practitioner.

Frank E. Tibbals (ONT '94), 84, Somerset, Ky., died recently. Dr. Tibbals, a resident of Somerset for seventy-two years, had spent sixty of them as a veterinarian and pharmacist. He is survived by a daughter.

Roy E. Tilden (STJ '18), 67, Blair, Neb., died Oct. 21, 1953. Dr. Tilden was a general practitioner.

T. C. Tregilgus (ISC '17), 61, Sibley, Iowa, died Jan. 14, 1954. Dr. Tregilgus served in the U. S. Army, Veterinary Corps, during World War I, and then practiced in Sibley until 1944. He then served on the staff of the U. S. Department of Agriculture, Bureau of Animal Industry, until his retirement in 1952.

★**John C. Wainright** (ONT '05), 75, Calgary, Alta., died on April 16, 1954, after a prolonged illness. Dr. Wainright established a practice in northern Alberta after receiving his D.V.M. degree. On joining the Alberta Veterinary Medical Association approximately twenty years ago, he devoted the major portion of his energies toward the interests of the veterinarians in the Province of Alberta and served as secretary of the Association until his death. He gave unstintingly of his time and talents and his service went far beyond the call of duty; no task was too large or too small for him in this connection.

Dr. Wainright was also a member of the Canadian Veterinary Association and of the AVMA. He is survived by his widow, a daughter, and a son.

Flavus Weaver (MCK '10), 73, Chicago, Ill., died in February, 1954. Dr. Weaver, who had retired as government meat inspector, is survived by his widow, two daughters, and two sons.

Herschel J. Weaver (IND '17), 62, Hagerstown, Ind., died April 2, 1954. Dr. Weaver, a general practitioner, had been a member of the AVMA.

Goldie J. Webb (IND '15), 62, Sullivan, Ind., died in February, 1954. Dr. Webb was a general practitioner.

Calvin D. Werley (OVC '95), 82, Allentown, Pa., died early in January, 1954, Dr. Werley was president of the New Tripoli National Bank for more than twenty-five years and had practiced veterinary medicine for more than fifty-two years. He is survived by a son, two grandsons, and four great-grandchildren.

C. L. Woolard (OVC '17), Galatia, Ill., died Dec. 9, 1953. Dr. Woolard was a general practitioner.

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COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

Texas Conference for Veterinarians. Annual conference. School of Veterinary Medicine, A. & M. College of Texas, College Station, Texas, June 3-4, 1954. R. D. Turk, chairman.

Kansas State College Conference for Veterinarians. Kansas State College, Manhattan, Kan., June 4-5, 1954. E. E. Leasure, dean, School of Veterinary Medicine.

Nebraska State Veterinary Medical Association. Summer meeting. Yancey Hotel, Grand Island, Neb., June 13, 1954. W. T. Spencer, 1250 North 37th Street, Lincoln, Neb., secretary.

Wyoming Veterinary Medical Association. Annual meeting. Cody, Wyo., June 13-14, 1954. John F. Ryff, P.O. Box 960, Laramie, Wyo., secretary.

Georgia Veterinary Medical Association. Annual meeting. Radium Springs Hotel, Albany, Ga., June 13-15, 1954. Chas. C. Rife, 420 Edgewood Ave., N.E., Atlanta, Ga., secretary.

Medical Library Association. Annual meeting. Hotel Statler, Washington, D. C., June 15-18, 1954. Lieutenant Colonel Frank B. Rogers, Armed Forces Medical Library, 7th Street and Independence Ave., S.W., Washington 25, D. C.

Montana Veterinary Medical Association. Annual meeting, Miles City, Mont., June 17-19, 1954. E. A. Tunnicliff, Agricultural Experiment Station, Bozeman, Mont., secretary.

Michigan State Veterinary Medical Association. Annual meeting. Beach Hotel, Charlevoix, Mich., June 18-19, 1954. Paul V. Howard, 4011 Hunsberger, N.E., Grand Rapids 5, Mich., secretary.

North Dakota State Veterinary Medical Association. Annual meeting. Gardner Hotel, Fargo, N. Dak., June 20-22, 1954. D. F. Eveleth, Fargo, N. Dak., secretary.

Idaho Veterinary Medical Association. Annual meeting. Twin Falls, Idaho, June 21-22, 1954. A. P. Schneider, 2025 N. 23rd St., Boise, Idaho, secretary.

California State Veterinary Medical Association. Annual convention. U. S. Grant Hotel, San Diego, Calif., June 21-23, 1954. Charles S. Travers, 3004 16th St., San Francisco, Calif., executive secretary.

North Carolina State Veterinary Medical Association. Annual meeting. Robert E. Lee Hotel, Winston-Salem, N. Car., June 22-23, 1954. Clyde W. Young, Mocksville, N. Car., secretary.

Maritime Veterinary Associations Joint Conference. Annual meeting. Mount Allison University, Sackville, N. B., June 22-24, 1954. Dr. J. F. Frank, Sackville, N. B., secretary, joint committee.

Pennsylvania, University of. Conference for veterinary radiologists. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., June 24-25, 1954. Teaching radiologists and practitioners invited. F. G. Fielder, 39th and Woodland Ave., Philadelphia 4, Pa., registrar.

Utah Veterinary Medical Association. Annual meeting. Ogden, Utah, June 24-25, 1954. Joe B. Thurman, 1407 S. State St., Orem, Utah, secretary.

Maryland State Veterinary Medical Association. Annual summer meeting. George Washington Hotel, Ocean City, Md., July 1-2, 1954. John D. Gadd, Cockeysville, Md., secretary.

Kentucky Veterinary Medical Association. Annual summer meeting. Seelbach Hotel, Louisville, Ky., July 21-22, 1954. T. J. Stearns, Room 216, Livestock Exchange Bldg., Louisville, Ky., secretary.

Virginia Veterinary Medical Association. Annual meeting, Monticello Hotel, Charlottesville, Va., Aug. 8-10, 1954. A. J. Sipos, 1102 State Office Building, Richmond, Va., secretary.

American Veterinary Medical Association. Annual meeting. The Olympic Hotel, Seattle, Wash., Aug. 23-26, 1954. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

New Mexico Veterinary Medical Association. Annual meeting. La Fonda Hotel, Santa Fe, N. M., Sept. 13-14, 1954. J. M. Miller, P.O. Box 149, Alamogordo, N. M., secretary.

New York State Veterinary Medical Society. Annual meeting. Saranac Inn, Saranac, N. Y., Sept. 15-17, 1954. Joan S. Halat, Utica, N. Y., acting executive secretary.

Conference for Veterinarians. Alabama Polytechnic Institute, Auburn, Ala., Sept. 16-18, 1954. R. S. Sugg, dean, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala.

Northern Illinois Veterinary Medical Association. Fall meeting. Hotel Faust, Rockford, Ill., Sept. 22, 1954. J. W. Boller, Harvard, Ill., secretary.

(Continued on p. 28)

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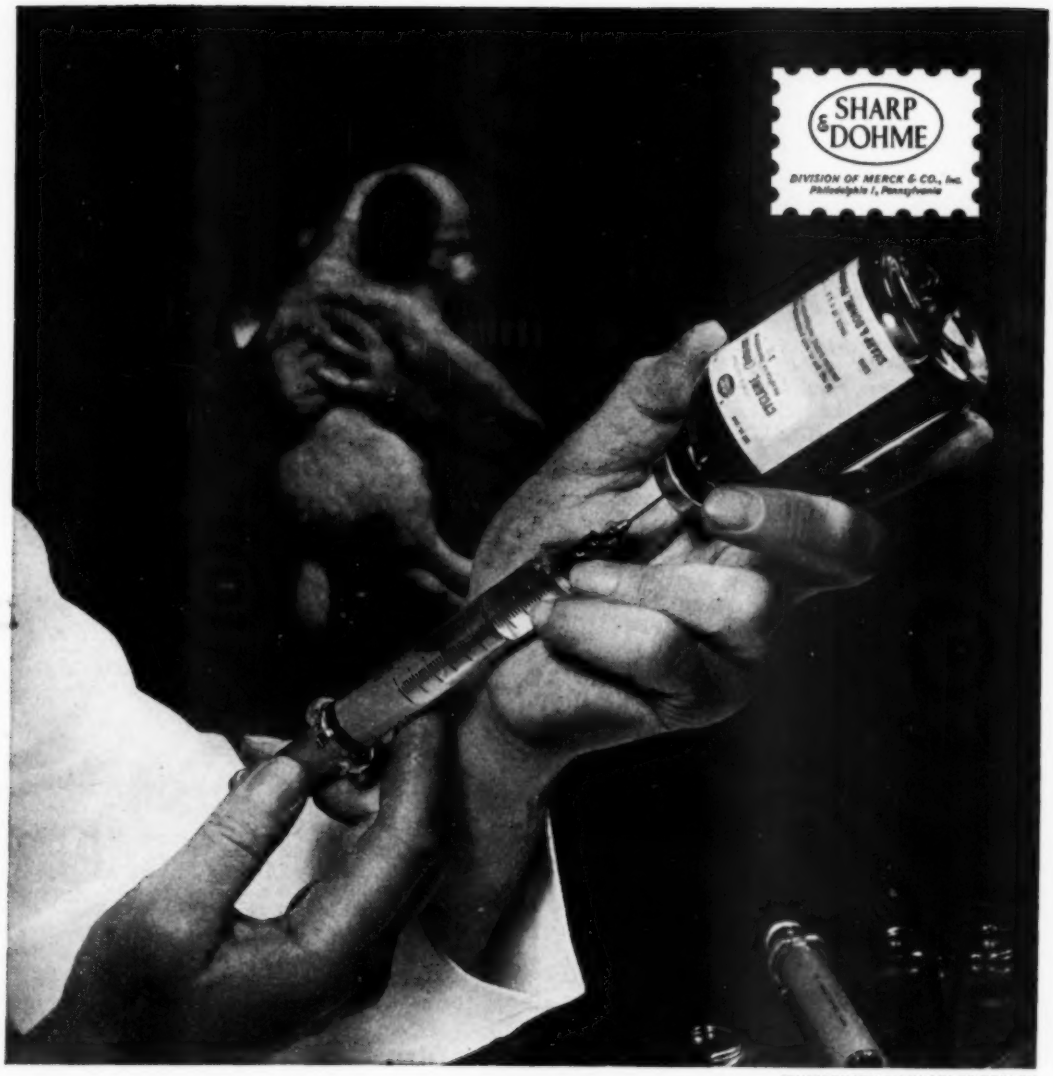

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Sharp & Dohme, Veterinary Department.

Reference: 1. Vet. Med. 48:269 (July) 1953.

Missouri, University of. Annual short course for veterinarians. School of Veterinary Medicine, University of Missouri, Columbia, Mo., Oct. 4-5, 1954. Cecil Elder, chairman.

Pennsylvania State Veterinary Medical Association. Annual meeting. Pocono Manor Inn, Pocono Manor, Pa., Oct. 13-15, 1954. R. C. Snyder, Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Eastern Iowa Veterinary Association, Inc. Annual meeting. Hotel Montrose, Cedar Rapids, Iowa, Oct. 14-15, 1954. Wayne H. Thompson, Earlville, Iowa, secretary.

South Dakota Veterinary Medical Association. Annual meeting. Cataract Hotel, Sioux Falls, S. Dak., Oct. 14-15, 1954. J. L. Noordsy, Marion, S. Dak., secretary.

Southern Veterinary Medical Association. Annual meeting. Asheville, N. Car., Oct. 18-20, 1954. A. A. Husman, 320 Agriculture Building, Raleigh, N. Car., secretary.

Department of Health, Education, and Welfare, in coöperation with the journal, *Antibiotics and Chemotherapy*. Symposium on Antibiotics. Washington, D. C., Oct. 20-22, 1954. Henry Welch, chairman.

New York State College of Agriculture at Cornell University. Annual nutrition conference for feed manufacturers. Statler Hotel, Buffalo, N. Y., Nov. 4-5, 1954. M. L. Scott, Rice Hall, Cornell University, Ithaca, N. Y., chairman.

U. S. Livestock Sanitary Association. Annual meeting. Hotel Fontenelle, Omaha, Neb., Nov. 10-12, 1954. R. A. Hendershott, 1 West State Street, Trenton 8, N. J., secretary.

Nebraska State Veterinary Medical Association. Annual meeting. Hotel Cornhusker, Lincoln, Neb., Dec. 1-3, 1954. W. T. Spencer, 1250 North 37th Street, Lincoln, Neb., secretary.

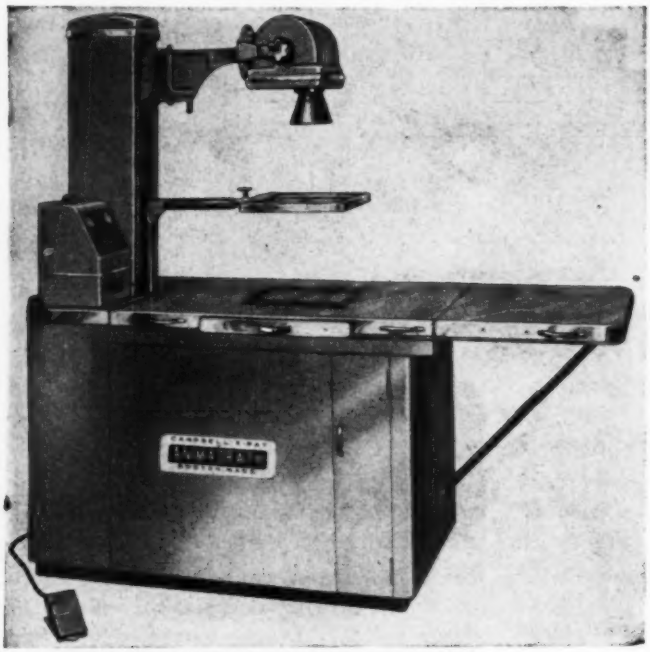
Ohio State Veterinary Medical Association. Annual meeting. Deshler-Hilton Hotel, Columbus, Ohio, Jan. 5-7, 1955. William S. Konold, 50 East Broad Street, Columbus 15, Ohio, executive secretary.

Foreign Meetings

British Caribbean Veterinary Association. Port-of-Spain, Trinidad, B.W.I., May 24-27, 1954. Dr. Stephen B. Bennett, c/o Department of Agriculture, St. Clair, Port-of-Spain, Trinidad, chairman, Organizing Committee.

Pan-African Days for Zootechnology. First meeting. Algiers, Algeria, Oct. 17-23, 1954. R. Camov, 3 Rue Péllissier, Algiers, Algeria, general secretary of the Societe Veterinaire de Zootechnie D'Algerie.

(*Continued on p. 30*)



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(COMING MEETINGS—*continued from p. 28*)

Regularly Scheduled Meetings

Atlanta Veterinary Society, the second Tuesday of every month. C. L. Bromley, Jr., 1634 Northside Drive, Atlanta, Ga., secretary.

Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison Streets, Baltimore, Md. Victor I. Sorgen, 133 Wiltshire Rd., Baltimore 21, Md., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of each month. George W. Eberhart, El Cerrito, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month (except July and August) at Black's Tea Room, Waterloo. F. E. Brutsman, Traer, Iowa, secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Paul A. Carlson, 5556 Bobolink Lane, Fresno, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro. Dr. J. S. Ellis, 2450 Battleground Ave., Greensboro, N. Car., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Wayne H. Riser, 5335 Touhy Ave., Skokie, Ill., secretary.

Coastal Bend Veterinary Association (Texas), the second Wednesday of each month. J. E. Hoban, 4301 S. Port Ave., Corpus Christi, Texas, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. J. R. Rosdail, Pomeroy, Iowa, secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month—September through May (except January)—at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Roger W. Grundish, 4217 Mayfield Road, South Euclid 21, Ohio, secretary.

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. Robert Clemens, 23352 Orchard, Hayward, Calif., secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly. C. B. Randall, Kinston, N. Car., secretary.

Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

(*Continued on p. 32*)

NEW PARD MEAL

with flavor dogs can't resist!

Wonderful flavor? Here's *proof*. You might say we've "gone to the dogs" to get it.

In a recent, impartial feeding test a large number of family-owned dogs were given the chance to compare Pard Meal side-by-side with another leading brand of dry dog food. The containers were unmarked. We even changed the *position* of the bowls at every feeding to be absolutely fair.

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(COMING MEETINGS—*continued from p. 30*)

Florida, North-East Florida Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. J. O. Whiddon, 829 San Marco Blvd., Jacksonville, Fla.

Greater St. Louis Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Luther E. Fredrickson, Room 11, Municipal Courts Bldg., St. Louis, Mo., secretary.

Houston Veterinary Medical Association, Houston, Texas, the first Thursday of each month. Edward Lepon, Houston, Texas, secretary-treasurer.

Illinois Valley Veterinary Medical Association, the second Sunday evening of even-numbered months at the Jefferson Hotel, Peoria, Ill. S. M. McCully, Lacon, Ill., secretary.

Indiana Tenth District Veterinary Medical Association, third Thursday of each month. L. A. Snider, New Palestine, Ind., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month, in Louisville or within a radius of 50 miles Dr. W. E. Bewley, P.O. Box "H", Crestwood, Ky., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at the Hotel Continental. J. A. Zacher, 3632 Main St., Kansas City, Mo., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month, in the Hotel Continental, 11th and Baltimore, Kansas City, Mo. J. C. Davis, 7332 Canterbury St., Kansas City 13, Mo., secretary.

Kern County Veterinary Medical Association, the first Thursday of each month. R. A. Stiern, 17 Niles St., Bakersfield, Calif., secretary.

Keystone Veterinary Medical Association, the Philadelphia County Medical Society Building, 301 S. 21st Street, Philadelphia, Pa., on the fourth Wednesday of each month. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

Kyowva Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Karl Mayer, 1531 Fourth Ave., Huntington, W. Va., secretary.

Maricopa County Veterinary Association, the second Tuesday of each month. Charles J. Prchal, 1722 East Almeria Road, Phoenix, Ariz., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from September through May, at the Academy of Medicine of Northern New Jersey, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Millburn Ave., Maplewood, N. J., secretary.

(*Continued on p. 34*)

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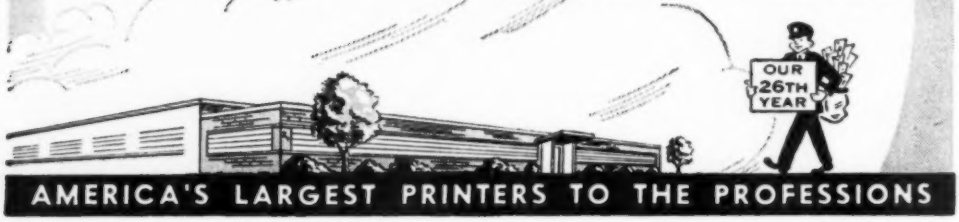

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(COMING MEETINGS—*continued from p. 32*)

Michiana Veterinary Medical Association, the second Thursday of each month, at the Hotel LaSalle, South Bend, Ind. Paul W. Hough, 829 Bryan St., South Bend, Ind., secretary.

Michigan, Southeastern Veterinary Medical Association, the second Thursday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Road, Detroit 5, Mich., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. George McCollister, 2146 Broad St., San Luis Obispo, Calif., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

Mobile-Baldwin Veterinary Medical Association, the first Tuesday of each month at the Hotel Admiral Simmes, Mobile, Ala. C. Eric Kennedy, Mobile, Ala., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 66 Marion Ave., Salinas, Calif., secretary.

New Castle County Veterinary Society, the second Wednesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. Harold Roberts, Paper Mill Road, Newark R3, Del., secretary.

New York City, Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Northern Colorado Veterinary Medical Association, the second Monday of each month. William D. Carlson, P.O. Box 478, Fort Collins, Colo., secretary.

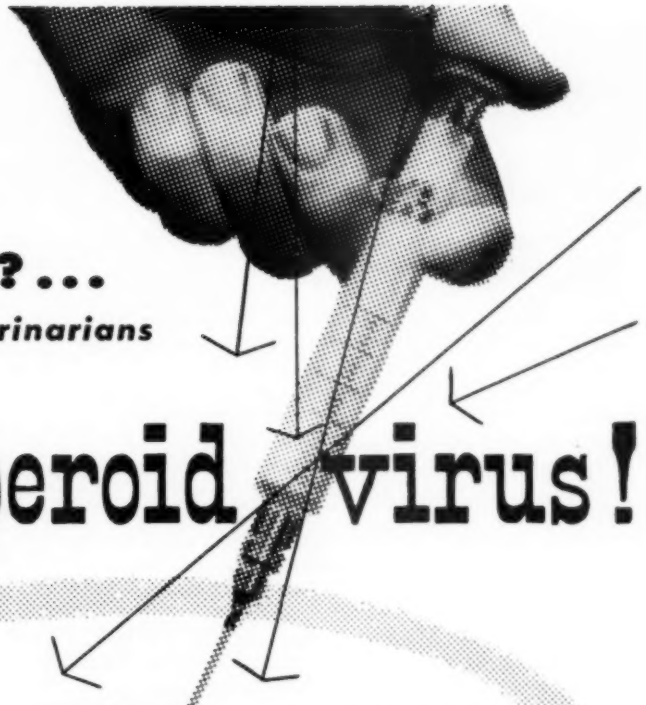
Northern New Jersey Veterinary Association, the fourth Tuesday evening from September through June, at the Casa Mana Restaurant, Cedar Lane, Teaneck, N. J. Robert R. Shomer, 1680 Teaneck Road, N. J., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Tom Hagan, Gen. Del., Escalon, Calif., secretary.

Oklahoma County Veterinary Medical Association, the second Wednesday of every month except August and July. R. J. Keller, 1701 N. Highland Drive, Oklahoma City, Okla., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month at 7:00 p.m. in the Antlers Hotel, San Bernardino, Calif. William J. Kelber, 1111 West A St., Ontario, Calif., secretary.

(*Continued on p. 36*)



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(COMING MEETINGS—*continued from p. 34*)

Orange County Veterinary Medical Association, bi-monthly. Donald E. Lind, 2643 N. Main, Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. P. H. Hand, Box 1035, Millbrae, Calif., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. G. V. McCranie, Hickory, N. Car., secretary.

Pima County (Arizona) Veterinary Medical Association, the third Wednesday of each month, in Tucson. R. W. Adami, 2103 S. 6th Ave., Tucson, Ariz., resident secretary.

Portland (Oregon) Veterinary Medical Association, the second Tuesday of each month, in the Auditorium of the Upjohn Company. Victor T. Oliver, 9705 S.W. Barbur Blvd., Portland 19, Ore., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. H. M. Strandberg, 203 D St., Petaluma, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. S. M. Foster, 430 College, Woodland, Calif., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. F. Ferguson, 1702 S. Dort Highway, Flint, Mich., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. Warren J. Dedrick, 904 S. Lemon, El Cajon, Calif., secretary.

San Fernando Valley (California) Veterinary Medical Association, the second Friday night of each month at Eaton's Restaurant in Studio City, Calif. Howard C. Taylor, 2811 W. Olive Ave., Burbank, Calif., secretary.

Santa Barbara-Ventura Counties Veterinary Medical Association, Friday evenings every sixth week. Dee Wodars McDermott, 5879 Hollister, Coleta, Calif., secretary.

Seattle Veterinary Medical Association, the third Monday of each month in the home of Dr. Fred Cummings, 5828-5th, N.W., Seattle, Wash.

Southern California Veterinary Medical Association, the third Wednesday of each month. Rankin W. McIntyre, 203 Administration Building, Union Stockyards, Los Angeles, Calif., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. A. Majilton, 1093 N. E. 79th St., Miami, Fla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month, in Director's Parlor of the Brookside State Bank, Tulsa, Okla. John Carnes, Muskogee, Okla., secretary.

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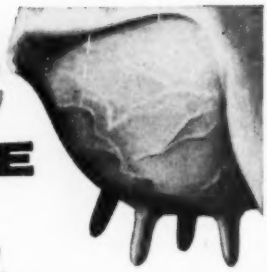

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(*Continued on p. 40*)

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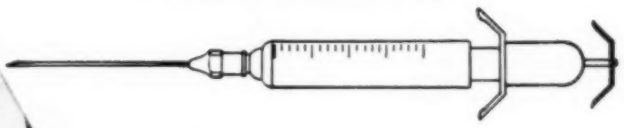

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Guaranteed Analysis	*Per Cent*
CRUDE PROTEIN, NOT LESS THAN	20.00%
CRUDE FAT, NOT LESS THAN	3.75%
CRUDE FIBRE, NOT MORE THAN	5.00%
CALCIUM, NOT LESS THAN	3.25%
CALCIUM, NOT MORE THAN	4.00%
PHOSPHORUS, (P) NOT LESS THAN	1.75%
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(CLASSIFIED ADS—*continued from p. 38*)

Veterinarian wanted for mixed practice. Good salary. Ohio license necessary. Address "Box A 15," c/o JOURNAL of the AVMA.

Veterinarian wanted, job especially suitable for foreign graduate or elderly man. Modern apartment, short hours, good pay, permanent. Address Dr. Edward J. Scanlon, 815 Montgomery Ave., Narberth, Pa.

Wanted—Positions

Veterinarian, 30, graduate University of Munich desires position as assistant. Experienced, especially in small animals. Speaks English. Will sign one-year contract or longer for affidavit. Will pay own passage. Address Dr. Albert Windul, Munich 58, Brodstr. 7, Germany.

European veterinarian desires position in small animal or general practice but will consider any kind of employment. Five years' European experience; fifteen months with busy, mixed practice in America including artificial breeding and sterility work. Married, age 31; good English. Address "Box A 10," c/o JOURNAL of the AVMA.

Veterinarian with experience in mixed practice and artificial insemination, presently on faculty of veterinary college, desires position in large animal practice in eastern United States. Own car, equipment; 31 years old, hard working. Write working conditions, salary, et cetera. Available in June. Address "Box X 7," c/o JOURNAL of the AVMA.

Experienced, graduate veterinarian available for relief work while you are on vacation. Licensed. Address "Box X 4," c/o JOURNAL of the AVMA.

British veterinarian, degree recognized by AVMA, seeks position in mixed practice in Washington, Oregon, or British Columbia coast. Fully experienced in all branches. Married. Address R. Earnshaw, M.R.C.V.S., R.R. 2, Sardis, B.C., Canada.

Experienced small animal veterinarian desires to work for a month starting about August 14 for a Middlewest small animal practitioner. State salary and if sleeping quarters are available. Address "Box A 11," c/o JOURNAL of the AVMA.

Remittance must accompany advertisement

Veterinarian, ten years' experience in teaching, research, graduate work (physiology, pharmacology, biochemistry), commercial work (therapeutics). Graduate of approved school, licensed, age 35. Desires suitable position with opportunity for advancement. Address "Box A 14," c/o JOURNAL of the AVMA.

(*Continued on p. 42*)

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(CLASSIFIED ADS—*continued from p. 40*)

Veterinarian, graduated Italy, 1948, presently employed ARS wants a job as assistant in small animal practice. New York, New Jersey, Connecticut, Massachusettes preferred. New car; excellent worker. Address "Box A 13," c/o JOURNAL of the AVMA.

European veterinarian, recognized school, experienced in large and small animals, looking for permanent position as assistant in mixed or small animal practice. Married; age 45. Address "Box A 16," c/o JOURNAL of the AVMA.

Veterinarian desires position with general practitioner in North Carolina with possibility of partnership. Graduate AVMA-approved school, North Carolina license; six years' experience, general practice. Have some capital; married, age 29. Best of references. Address "Box A 18," c/o JOURNAL of the AVMA.

Remittance must accompany advertisement

European veterinarian seeks assistantship. Graduated from AVMA-recognized school; 37 years of age. Five years of experience in small animal practice in this country. Address "Box A 22," c/o JOURNAL of the AVMA.

German veterinarian desires position as assistant or manager in small animal hospital. Five years in the United States; small animal experience. Graduated from approved veterinary college. Address "Box A 23," c/o JOURNAL of the AVMA.

Wanted—Practices

Want to buy small animal hospital or mixed practice in central or south Florida. Include all details in first letter. Address "Box A 2," c/o JOURNAL of the AVMA.

Want to buy, or lease with option to buy, small animal practice in greater Philadelphia or Camden areas. Address "Box A 5," c/o JOURNAL of the AVMA.

Want small animal practice in Florida. Will buy, lease with option to buy, or enter group practice. Have Florida license and fourteen years of small animal experience. Address "Box A 8," c/o JOURNAL of the AVMA.

Experienced small animal practitioner wishes to buy or lease small animal practice. Prefer Pennsylvania, Maryland, or Delaware but will consider other locations. Address "Box A 12," c/o JOURNAL of the AVMA.

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Mixed practice for sale in western Montana; modern 13-room small animal hospital, large animal corrals, stable, and stocks. Yearly gross with two men over $30,000; price, $35,000, actual appraisal of building. Address "Box V 30," c/o JOURNAL of the AVMA.

(*Continued on p. 44*)

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Established mixed practice for sale in southern California; includes new brick home with small animal clinic. Down payment, $10,000; balance monthly at 6% interest. Total price, $29,500. Address "Box M 17," c/o JOURNAL of the AVMA.

Practice established forty years for sale, $3,000 cash. Includes instruments, drugs, furniture; kennels for forty dogs. Owner retiring. Address "Box A 3," c/o JOURNAL of the AVMA.

Small animal hospital for sale. Spacious, fully equipped, remodelled recently; two hours from New York City. Excellent clientele, no competition; buyer must be experienced. Over an acre of landscaped property; home included. Price, $45,000; terms, with $15,000 down. Address "Box A 4," c/o JOURNAL of the AVMA.

Well-established small animal hospital for sale in large Ohio city. Fast growing practice; ideal for energetic man. Practice includes drugs, kennels, equipment, and x-ray. No real estate involved. Price $6,500 cash; terms, $3,500 down, $3,500 balance payable in six months. Address "Box Y 6," c/o JOURNAL of the AVMA.

Animal hospital for sale in Southwest; population, 5,000. Practice grossed $10,000 last year; owner will sell for price of inventory, about $1,000. Address "Box A 6," c/o JOURNAL of the AVMA.

Small animal practice and equipment for sale. Southeast Florida; no real estate involved. Details furnished to Florida license holders. Address "Box A 7," c/o JOURNAL of the AVMA.

Mixed practice for sale in Indiana; includes new home and office, drugs, and instruments. Gross, $14,000. Total price, $16,500; $5,000 will handle. Address "Box X 33," c/o JOURNAL of the AVMA.

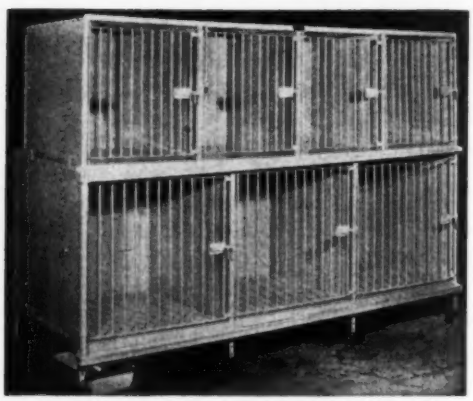
Established mixed practice for sale in good dairy section of western New York. Will sell for value of real estate plus inventory of equipment and drugs wanted. Excellent terms. Only reason for selling—health factor. Address "Box V 13," c/o JOURNAL of the AVMA.

Small animal hospital for sale; profitable, established practice. Landscaped, fine house, commuting distance from New York City, on main highway in Fairfield County, Connecticut. Please state experience in practice and amount of capital available for purchase on terms. Address "Box V 3," c/o JOURNAL of the AVMA.

Excellent small animal hospital for sale in Hollywood, Calif. No real estate. Fully equipped; priced to sell. Address "Box A 21," c/o JOURNAL of the AVMA.

(*Continued on p. 46*)

DE LUXE CAGES AND DOG DRYER



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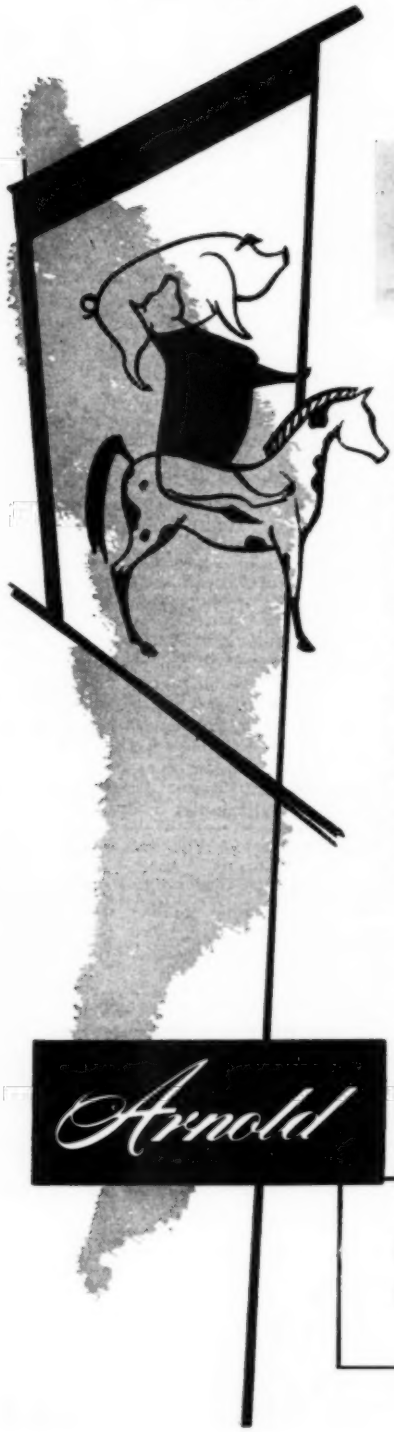

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PROGESTERONE SOLUTION — to stimulate endometrium development and secretions, favor nidation of ovum in hard to settle or repeat breeders, prevent habitual and threatened abortion, treat cystic ovaries and nymphomania, delay estrum, stimulate growth of mammary alveolar tissue, induce lactation.
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ANTERIOR PITUITARY — may be useful for agalactia of brood sows, supportive treatment in bovine ketosis, increase milk secretion in cases of decreased flow following parturition.
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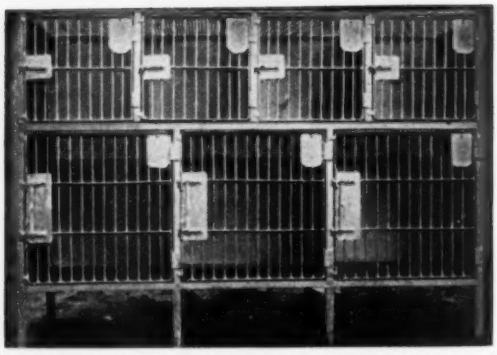

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(CLASSIFIED ADS—*continued from p. 44*)

Small animal hospital near Los Angeles, for sale. No real estate; 40-animal capacity. Gross $26,000; $12,500 cash or $13,500 terms with $5,000 minimum down. Address "Box W 17," c/o JOURNAL of the AVMA.

A golden opportunity for veterinarian who wishes to semi-retire in California. New home with small hospital for sale and a good net with little work. Terms. Address "Box M 16," c/o JOURNAL of the AVMA.

For sale in suburban Philadelphia, 30-cage fully equipped animal hospital on main highway. Valuable real estate includes two four-room apartments, four-car garage easily conveted to kennel building; parking facilities. Gross $15,000, plus. Price approximately $40,000; approximately half in cash necessary. Selling for other interests. Address Box A 19," c/o JOURNAL of the AVMA.

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Thriving small animal practice for sale in middle- and upper-class area, suburban Philadelphia. Ideal location on important highway. Fine hospital, boarding or breeding kennels; 62-animal capacity; concrete runs, cylcone fenced. Excellent house for owner or attendant, all modern improvements, 6 rooms, office, garage. $30,000; owner will help finance. Address Ball and Coffin, agents, Jenkintown, Pa.

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(*Continued on p. 48*)

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(CLASSIFIED ADS—*continued from p. 461*)

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(*Continued on p. 541*)

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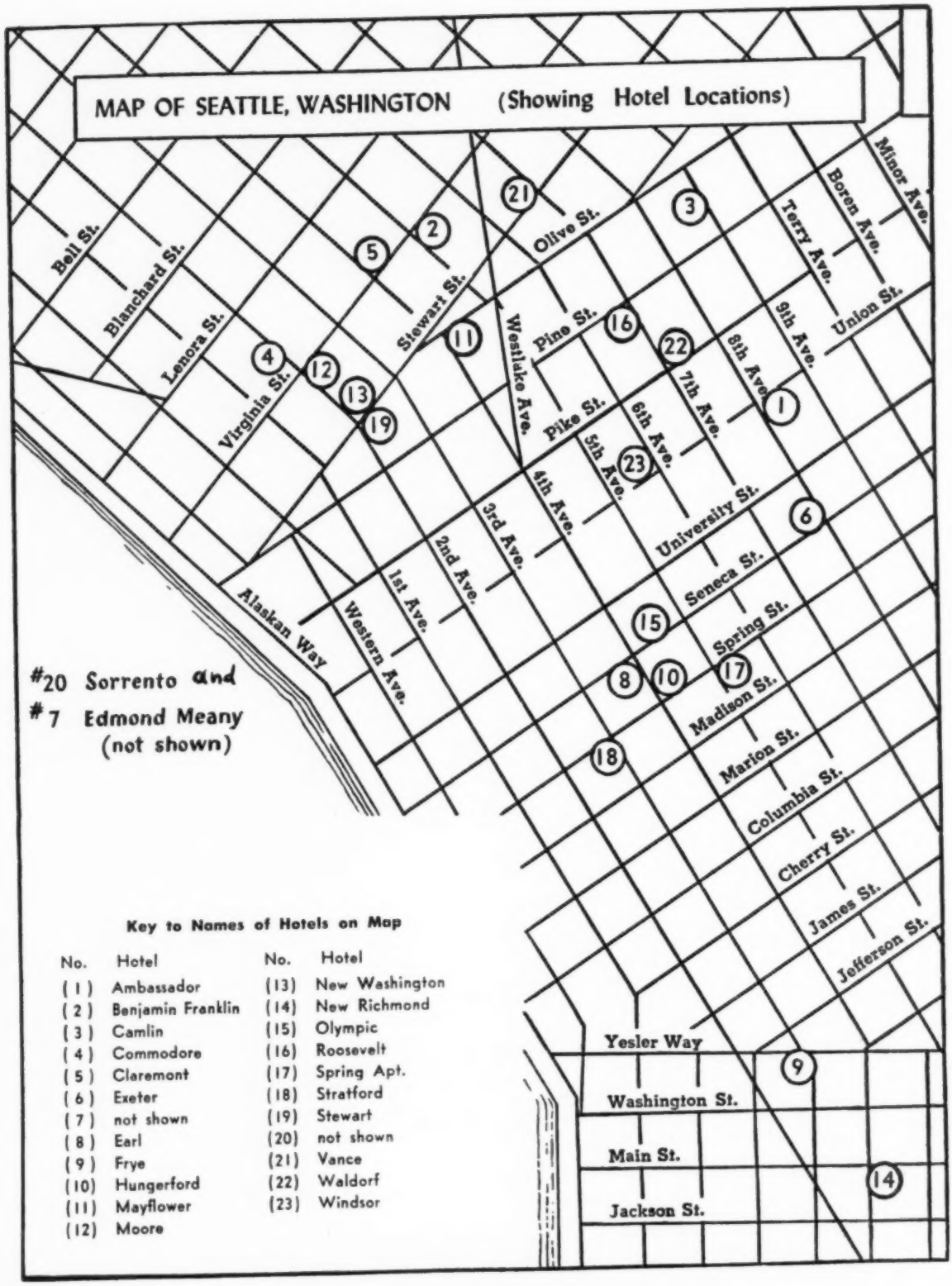

Key to Names of Hotels on Map

No.	Hotel	No.	Hotel
(1)	Ambassador	(13)	New Washington
(2)	Benjamin Franklin	(14)	New Richmond
(3)	Camlin	(15)	Olympic
(4)	Commodore	(16)	Roosevelt
(5)	Claremont	(17)	Spring Apt.
(6)	Exeter	(18)	Stratford
(7)	not shown	(19)	Stewart
(8)	Earl	(20)	not shown
(9)	Frye	(21)	Vance
(10)	Hungerford	(22)	Waldorf
(11)	Mayflower	(23)	Windsor
(12)	Moore		

HOTEL RESERVATIONS — SEATTLE CONVENTION

Ninety-First Annual AVMA Meeting, Aug. 23-26, 1954

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Committee on Local Arrangements. The Bureau will clear all requests and confirm reservations.

HOTELS AND RATES

HOTEL	SINGLE	DOUBLE	TWIN BEDS
1. Ambassador	$5.00	$6.00	———
2. Benjamin Franklin	$7.00	$10.00-11.00	$11.00-15.00
3. Camlin	$7.50	$10.00	$12.00
4. Commodore	$4.50	$6.00	———
5. Claremont	$4.50	$5.50-10.00	———
6. Exeter	$5.50	$7.50	$9.00
7. Edmond Meany	$6.00	$8.00-9.50	———
8. Earl	$4.50	$6.00	$7.00
9. Frye	$4.00	$6.00	$7.50
10. Hungerford	$5.00-6.00	$7.00-9.00	———
11. Mayflower	$7.00	$10.00-11.00	$12.00-14.00
12. Moore	$5.00	$7.00	$8.00
13. New Washington	$5.50-12.00	$8.50-14.00	$9.50-16.00
14. New Richmond	$3.50-4.00	$5.00-5.50	$6.50
15. Olympic	$6.00-15.00	$8.00-15.00	$9.50-15.00
16. Roosevelt	$6.00	$8.00	$10.00
17. Spring Apt.	$5.00	$7.00	$8.00-9.00
18. Stratford	$5.00	$7.00	———
19. Stewart	$5.50-7.50	$6.50-8.50	$9.50
20. Sorrento	———	———	$6.00-8.00
21. Vance	$5.75	$5.50-6.75-7.50	$7.50-8.00
22. Waldorf	$2.50-3.50(*) $5.00	$3.50-5.00(*) $6.50	$7.50
23. Windsor	$6.00	$8.00	$9.00

(*) without bath. Tear Here

HOTEL RESERVATION FORM — AVMA CONVENTION — SEATTLE

To: Housing Bureau, Seattle Hotel Association,
315 Seneca Street, Seattle, Washington

Date .....

Please make reservations indicated below:

(Three Choices MUST Be Shown)

First choice hotel .....

Second choice hotel .....

Third choice hotel .....

Accommodations and Rates Per Day Desired:

- ☐ Single room at $.....
- ☐ Double-bed room at $.....
- ☐ Twin-bed room at $.....
- ☐ Suite* at $.....

(*) Those desiring suites should clearly specify type of accommodations wanted.

Arriving on (date) .....at.....a.m.....p.m.

Leaving on (date) .....at.....a.m.....p.m.

Room will be occupied by (attach list of additional names if necessary).

Name .....City and State or Province .....

Name .....City and State or Province .....

Your Name (Print or Type) .....

Street Address .....City and State or Province .....

A HIGHLY EFFECTIVE

SQUIBB

CANINE ANTHELMINTIC-

SORUNEX®

veterinary SQUIBB

new!

As an anthelmintic in dogs, Sorunex (Hexylresorcinol) kills ascaris and hookworms outright in the intestine, decreasing migration to a minimum.

Efficient vermicide – A single therapeutic dose properly administered is from 90 to 100% efficient.

Toxicity negligible – Toxicity is clinically negligible, making Sorunex a superior product for use in puppies, and dogs in a weakened condition.

Special hard coating – The special hard coating makes it improbable that a tablet will be broken in the dog's mouth.

Supplied in bottles of 100 tablets, 0.20 Gm. per tablet. Available from your veterinary supply house. For further information, address: E. R. SQUIBB & SONS, *Division of Mathieson Chemical Corporation,* Dept. JA-6, 745 Fifth Avenue, New York 22, N. Y.

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Amazing! Joseph Goder Incinerator Helps You

get rid of refuse

fast!

Disposall No. 5-T

There's a safe, sanitary, easy way to dispose of pathological waste, animal waste, laboratory waste. Destroy it completely under the intense blast gas flames of a Joseph Goder Disposall No. 5-T!

This remarkable incinerator, designed especially for the veterinarian, has a special grate to catch and eliminate liquids in the refuse — operates odorlessly, economically. Not a free-flowing gas burner, but a much intensified blast-type gas burner.

This feature, plus its exceptional refractory lining and its fool-proof insulation, make the Joseph Goder 5-T what it is — one of the safest, fastest disposals available to the veterinarian.

SEE FOR YOURSELF! Wet, damp, or dry, the refuse "JUST VANISHES" in a Joseph Goder Incinerator.

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See your classified telephone directory for the name of the Joseph Goder Representative nearest you . . . or write to Joseph Goder Company for complete information.

JOSEPH GODER INCINERATORS

5121 N. Ravenswood Ave. • Chicago 40, Illinois

(CLASSIFIED ADS—*continued from p. 48*)

Received Too Late to Classify

Large animal practice, 85% dairy cattle, and large home on acreage, for sale in Arizona. Ideal climate and working conditions. $24,000 gross business. $26,000, total price; $15,000 down. Address "Box A 24," c/o JOURNAL of the AVMA.

Large animal practice for sale in Middlewest Ohio; 75 % dairy cattle. Grossed $11,000 last year; opportunity for enlargement is fine. Only veterinarian on telephone exchange. Office downstairs, apartment upstairs in uptown business building. Owner moved West because of ill health. Contact Earl C. Bechdolt, 612 E. Bellefontain St., Wapakoneta, Ohio.

Veterinarian desires permanent position with progressive small animal practitioner leading to partnership or purchase of practice. Prefers large city in New Jersey, Pennsylvania, Maryland, or Virginia. In answering furnish complete details. Address "Box A 25," c/o JOURNAL of the AVMA.

33 years ago they told me:

"YOU HAVE LESS THAN A YEAR TO LIVE!"

"MUST HAVE BEEN back in 1919 or '20. Hopeless case of diabetes. No known cure.

"BUT HERE I AM. They found a treatment —insulin—in time. Today, *nobody* has to die of diabetes.

"CANCER, I know, is a tougher problem. But the laboratories can lick that one, too—with our support. Already, they're curing people who would have been done for a few years ago. Last year—thanks to $5,000,000 allocated by the American Cancer Society from our contributions—they found out a lot more . . . though there's still a long way to go.

"THEY NEED MONEY, though. $5,000,000 is still less than 4 cents per American *per year*. Not enough to find the answer *fast* enough—230,000 Americans are going to die of cancer *this year*, they say.

"I'M NOT RICH, but I gave 'em $50 last year—hope to do better this time. After all, where would *I* be if the laboratories working on diabetes, that time, hadn't been given enough support—?"

Cancer
MAN'S CRUELEST ENEMY
Strike back—Give
AMERICAN CANCER SOCIETY

NEW small animal cage of molded fiberglas, cleans easily, won't rust, never needs paint

These new Kirschner cages are unlike any cage you've ever seen. Made of white fiberglas-reinforced plastic (pale green, and light grey, also, if you prefer), they are water-proof, stain-resistant and tough as rhino hide!

Your attendants will appreciate the quick, easy way these cages clean up. There are no seams to collect dirt or vermin. Corners are rounded. No trays and no gutter . . . unless you specify that style cage.

Clients are impressed with the smart "looks" of the new Kirschner cage. Veterinarians even tell us it's the first cage they've ever seen that had a professional, hospital-like appearance.

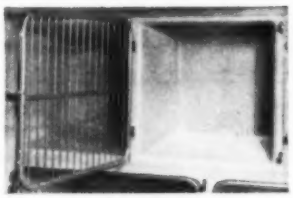
Since fiberglas is warm-to-the-touch (unlike metal), the new cage is easy on the patient. Floor and walls are smooth — no crevices for foot pads to catch in. Drafts are also cut to a minimum.

No painting will ever be needed once you install Kirschner cages. There is nothing to rust or corrode. Cage doors are lifetime aluminum construction. The savings on annual painting alone can easily pay for the slight extra "first cost" of the new Kirschner cages.

We hope this sounds just like what you've been looking for in a small animal cage. We've printed a small folder which gives you prices and detailed facts about this cage and its variety of sizes. Why not fill in the coupon and mail it today.

Kirschner Manufacturing Company
Vashon, Washington
Please send folder on the new Kirschner cages.

_____DVM
_____street
_____place



Model R-1
features floor sloped toward rear, eliminating need for gutter or tray.

Model R-2
with floor sloping toward front. Gutter available in stainless steel or aluminum.

Model R-3
has flat floor. All cages available with or without Kirschner **lifetime** aluminum doors.

another

ROCKLAND "SCOOP!"

Random sampling of ROCKLAND STOCK DIETS resulted in 100% *negative findings* by laboratory examination* for the presence of SALMONELLA organisms. To those engaged in delicate and routine research who may have been concerned with the all-important matter of CONTAMINATION, Rockland Mouse Diet, Rockland Monkey Diet, Rockland Rabbit Ration, Rockland Rat Diet ("D" free), Rockland Rat Diet (complete) and Rockland Guinea Pig Diet ("C" fortified) can now be offered free of SALMONELLA organisms and ANTIBIOTIC ACTIVITY.

**Insist upon ROCKLAND (antibiotic free) prepared feeds and ROCKLAND fed animals.*

**Aliquot of samples placed in Selenite-F enrichment medium. After 6 to 8 hrs. incubation at 37°C, cultures streaked on brilliant green and McConkey's agar plates. Routine examination of suspicious colonies followed.*

ARCADY

ROCKLAND MOUSE DIET
ROCKLAND MONKEY DIET
ROCKLAND RAT DIET ("D" free)
ROCKLAND RAT DIET (Complete)
ROCKLAND GUINEA PIG DIET ("C" fortified)
THEY MAY BE OBTAINED THROUGH YOUR LOCAL DEALER FROM
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Obtain your regular supply of
MICE • RATS
GUINEA PIGS
RABBITS
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ROCKLAND FARMS
New City, Rockland County
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(Current price list on request)

BROKEN TEETH

—repaired in bottom clipper blades. Top and bottom blades sharpened to match. Save money—Guaranteed. Prices on Request

HIGHLY SPECIALIZED SHARPENING
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Prompt Service—Est. 17 years

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Female Budgies Can Talk.—Despite much publicity to the effect that female budgerigars never talk, this is not true. The difficulty lies with the owner who, convinced that the female won't talk, usually makes no effort to train it.—*All Pets Magazine, Dec., 1953.*

Maude, an Illinois mare, died recently at the age of 36 years, 8 months. Maude worked from 1920 to 1952.—*Prairie Farmer, Feb. 6, 1954.*

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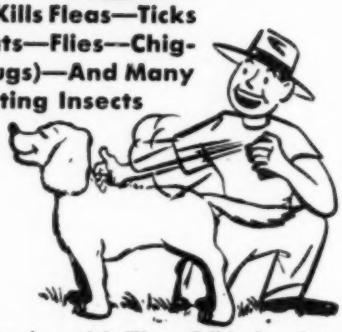
Repels And Kills Fleas—Ticks —Lice—Gnats—Flies—Chiggers (Red Bugs)—And Many Other Irritating Insects



$1.25* —wherever pet supplies are sold

Proved in hospitals and kennels everywhere

Just mist your dog with Fleas-Off before letting him play and roam. Keep him healthy and happy by spraying his sleeping quarters.

Any Dog's Best Friend... Fleas-Off!

WHITMIRE LABORATORIES • ST. LOUIS 10, MO.

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Official organ of American Society of Parasitologists

A medium for the publication of papers on Animal Parasites (Protozoa, Helminthes, Arthropoda).

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IN TWO TIERS: 4, 6, and 8 cage units
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Sanitary, durable, and easily maintained; galvanized materials; removable pans; hand woven wire mesh doors, maximum light and ventilation; sized for dogs and cats; removable partitions; shipped crated; easily assembled.

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Sunbeam STEWART CLIPMASTER

Powerful Motor Inside the Handle

Keep your dog clipped the year 'round for a healthier, cleaner pet. Clipped dogs look better, feel better, shed less, have fewer skin disorders, and are easier to keep clean. Clipmaster has powerful, cool-running motor. Perfect tension control makes blades last longer. Special bottom Clipping blades available for all breeds of dogs. Sunbeam Stewart Clipmaster is available at all good hardware and implement dealers. $39.95 (Colorado and West $40.25).

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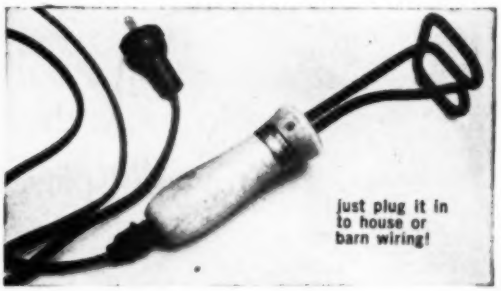
Dept. 47, 5600 Roosevelt Road, Chicago 50, Ill.



New **electric** branding iron uses 110 volt current, heats in just 90 seconds!

Here's the neatest, slickest thing in branding irons yet. This new NICHOLSON *electric* branding iron heats in only 90 seconds on regular 110 volt AC-DC current! Just plug it into house or barn wiring. Won't smoke or corrode. Uses the same fast-heating elements they use on the newest electric ranges. Element is formed into letter B, 3½" high. Supplied complete with 6 foot cord for $21.50. Special 25 foot extension cord, $6.00. Prices FOB Denver. All NICHOLSON precision veterinary equipment is guaranteed—money back if you aren't satisfied.

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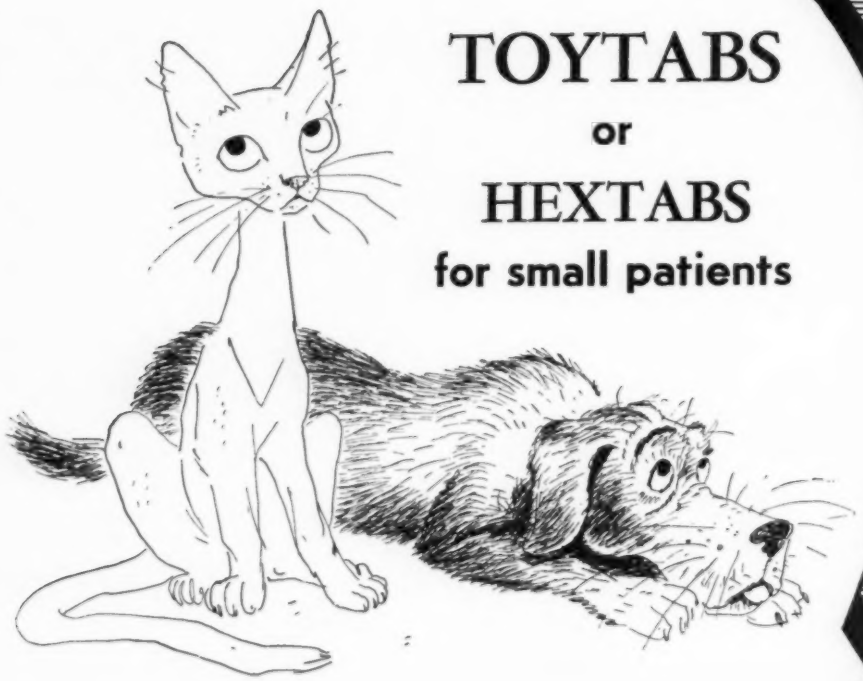

TOYTABS
or
HEXTABS
for small patients

No more dividing tablets when treating puppies, kittens or toy breeds

Toytabs and Hextabs are just what the "doctor" ordered for precision dosage and the assurance of safe, predictable results. Toytabs are available in *twelve formulas* that are most in demand for practice and dispensing purposes.

Hextabs are also explicitly made for small animal medication and their characteristic hexagon shape affords instant recognition on the dispensing shelf or in the emergency bag. Convenient sizes for small animals in over *forty* different formulas.

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Swine Erysipelas Control

The first thought—

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The name *Lockhart* is to Anti-Swine Erysipelas Serum as Cadillac is to the automobile — America's finest.

Now Erysipelothrix Rhusiopathiae Vaccine Desiccated as the companion product.

Liquid vaccine is also available for use during the busy vaccination season.

This will be the swine producers' year — high market value hogs — low priced serum.

ASHE LOCKHART, INC.

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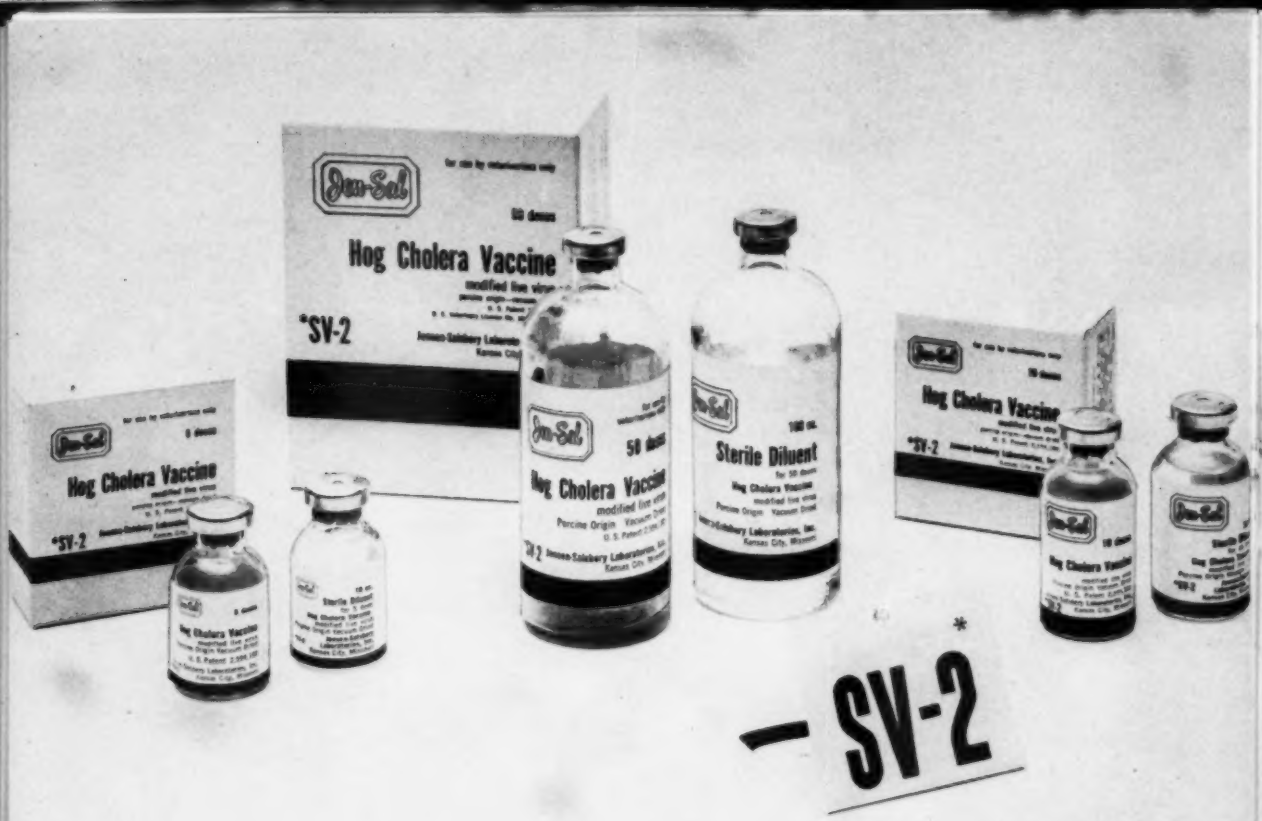

an open letter to a veterinarian who hasn't yet tried modified live virus hog cholera vaccines

Dear Doctor: For several years, veterinarians have been cautiously testing and evaluating various modified live virus hog cholera vaccines. During this period, Jen-Sal research men were also studying new vaccines—their advantages, disadvantages, and future possibilities.

Now, based on years of conservative, careful evaluation, Jen-Sal is marketing a modified live virus, hog cholera vaccine of porcine origin (to be administered simultaneously with 15 cc. hog cholera serum.) Jen-Sal feels that this product is the safest most logical successor to time-tested serum-virus immunization.

This new vaccine is named SV-2 for SIMULTANEOUS VIRUS METHOD No. 2. It is a proven immunological advancement—giving durable immunity without post-vaccination virus flare-ups.

SV-2 (Jen-Sal) is now available in 5, 10, and 50 dose packages. We recommend it to you with confidence. A new brochure on SV-2 is now ready—write for your copy soon.

Jensen-Salsbery Laboratories, Inc.
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